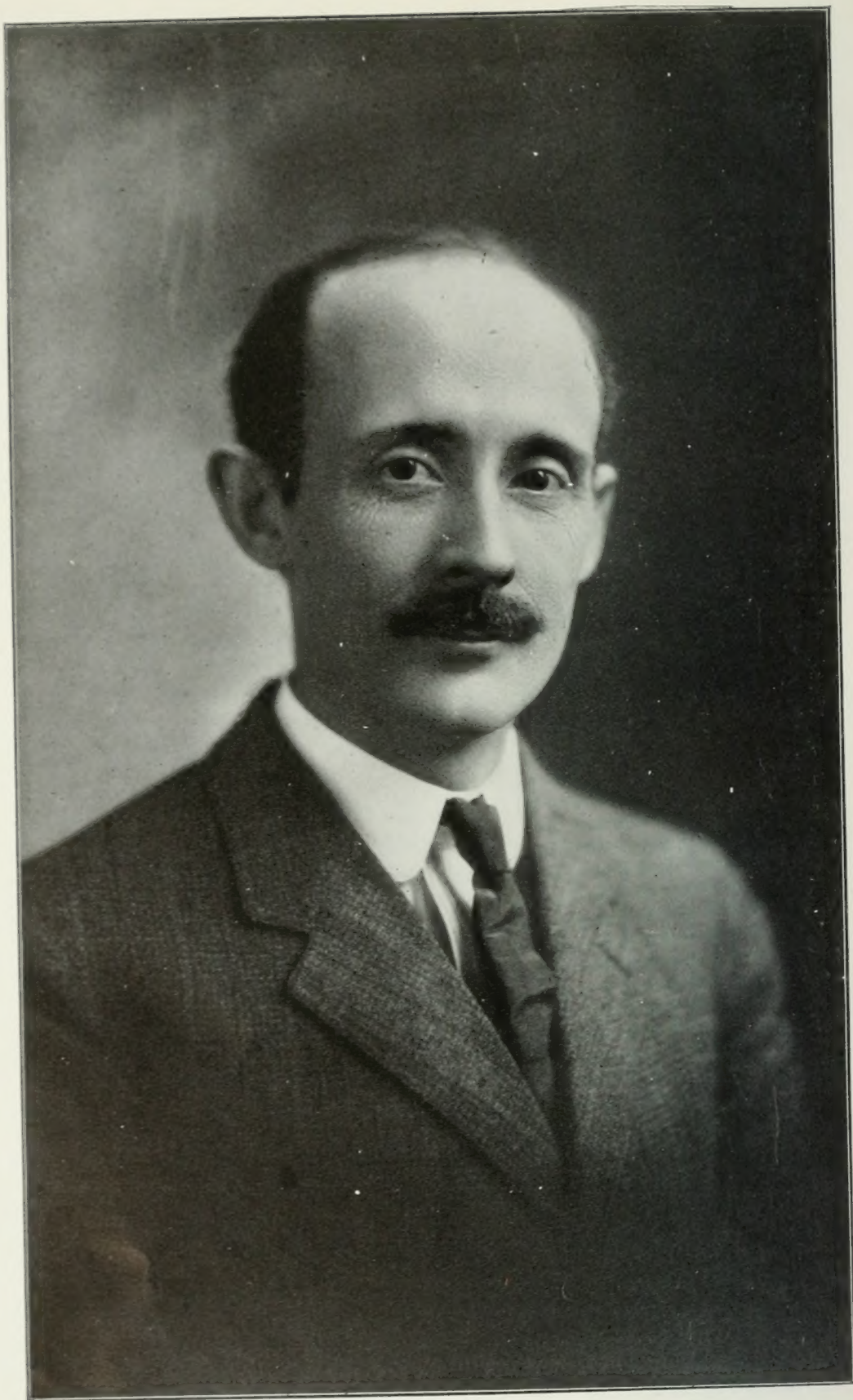


ONTARIO
COLLEGE OF PHARMACY
44 GERRARD ST. E.
TORONTO,

ONTARIO
COLLEGE OF PHARMACY
44 GERRARD ST. E.
TORONTO.



WILLIAM BAKER DAY.

President 1912-1913.

William Baker Day, born Peru, Illinois, February 15, 1871. Educated in the public schools, Peru, Ill., Chicago, Ill., and the high school at Wheaton, Ill. Employed in drug stores in Chicago from 1888 to 1892. Junior year Chicago College of Pharmacy 1888-'89. Senior year 1891-'92. Actuary Chicago College of Pharmacy 1892-'96. Actuary University of Illinois School of Pharmacy 1896 to date. Secretary of the Faculty 1897-1913. Professor of Histological Botany 1900-'13. Professor of Botany and Materia Medica and Acting Dean 1913. Secretary Illinois Pharmaceutical Association 1906-'13. Secretary Chicago Branch of the American Pharmaceutical Association 1906-'12. Vice-President Chicago Branch 1913. Member of the A. Ph. A. since 1895. Chairman Committee on Membership 1906-'12. Third Vice-President 1908-'09. First Vice-President 1909-'10. President 1912-'13.

YEAR BOOK

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION

1912

OHIO
COLLEGE OF PHARMACY
24 COMMERCE
CINCINNATI

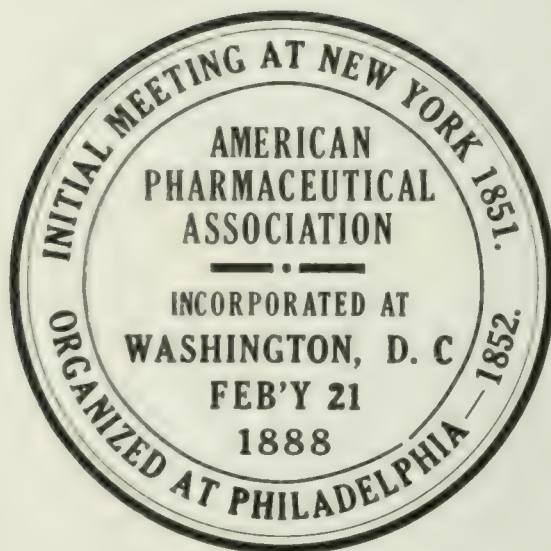
CONTAINING THE FIFTY-FIFTH ANNUAL REPORT
ON THE PROGRESS OF PHARMACY, AND
THE CONSTITUTION, BY-LAWS
AND ROLL OF MEMBERS

CORRESPONDING TO VOLUME SIXTY OF THE
FORMER PROCEEDINGS OF THE
AMERICAN PHARMACEUTICAL ASSOCIATION

SCIO, OHIO

PUBLISHED BY THE AMERICAN PHARMACEUTICAL ASSOCIATION

1914



LIST OF OFFICERS OF THE ASSOCIATION SINCE ITS ORGANIZATION

(NAMES OF DECEASED OFFICERS IN ITALICS)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Oct. 6, 1852..	Philadelphia, Pa..	<i>Daniel B. Smith,</i> Philadelphia.	<i>George W. Andrews,</i> Baltimore.	<i>Samuel M. Colcord,</i> Boston.	<i>C. Augustus Smith,</i> Cincinnati.
Aug. 24, 1853..	Boston, Mass.....	<i>William A. Brewer,</i> Boston.	<i>George D. Coggeshall,</i> New York.	<i>Alexander Duval,</i> Richmond, Va.	Charles B. Guthrie, Memphis, Tenn.
July 25, 1854..	Cincinnati, O.....	<i>William B. Chapman,</i> Cincinnati.	<i>Henry T. Cummings,</i> Portland, Me.	<i>John Meakin,</i> New York.	<i>Joseph Laidley,</i> Richmond, Va.
Sept. 11, 1855..	New York, N. Y.	<i>John Meakin,</i> New York.	Charles B. Guthrie, Memphis, Tenn.	<i>Charles Ellis,</i> Philadelphia.	<i>Henry F. Fish,</i> Waterbury, Conn.
Sept. 9, 1856..	Baltimore, Md.....	<i>George W. Andrews,</i> Baltimore.	<i>John I. Kidwell,</i> Washington, D. C.	<i>Frederick Stearns,</i> Detroit, Mich.	<i>Henry T. Kiersted,</i> New York.
Sept. 8, 1857..	Philadelphia, Pa..	<i>Charles Ellis,</i> Philadelphia.	<i>James Cooke,</i> Fredericksburg, Va.	<i>Samuel P. Peck,</i> Bennington, Vt.	A. E. Richards, Plaquemine, La.
Sept. 14, 1858..	Washington, D. C.	<i>John I. Kidwell,</i> Georgetown, D. C.	<i>Edward R. Squibb,</i> Brooklyn, N. Y.	<i>James O'Gallagher,</i> St. Louis.	Robert Battey, Rome, Ga.
Sept. 13, 1859..	Boston, Mass.....	<i>Samuel M. Colcord,</i> Boston.	<i>William Procter, Jr.,</i> Philadelphia.	<i>Joseph Roberts,</i> Baltimore.	<i>Edwin O. Gale,</i> Chicago.
Sept. 11, 1860..	New York, N. Y.	<i>Henry T. Kiersted,</i> New York.	<i>William J. M. Gordon,</i> Cincinnati.	<i>William S. Thompson</i> Baltimore.	<i>Theodore Metcalf,</i> Boston.
Aug. 27, 1862..	Philadelphia, Pa..	<i>Wm. Procter, Jr.,</i> Philadelphia.	<i>John Milhan,</i> New York.	<i>Eugene L. Massot,</i> St. Louis.	<i>J. Faris Moore,</i> Baltimore.
Sept. 8, 1863..	Baltimore, Md.....	<i>F. Faris Moore,</i> Baltimore.	<i>John M. Maisch,</i> Philadelphia.	<i>Chas. A. Tufts,</i> Dover, N. H.	<i>George W. Weyman,</i> Pittsburg.
Sept. 21, 1864..	Cincinnati, O.....	<i>William J. M. Gordon,</i> Cincinnati.	<i>Richard H. Stabler,</i> Alexandria.	<i>Enno Sander,</i> St. Louis.	<i>Thomas Hollis,</i> Boston.

LIST OF OFFICERS OF THE ASSOCIATION.

LIST OF OFFICERS (Continued)

Date.	Place of Meeting	Presidents.	First Vice Presidents	Second Vice Presidents	Third Vice Presidents.
Sept. 5, 1865.	Boston, Mass.....	<i>Henry W. Lincoln</i> , Boston.	<i>George C. Close</i> , Brooklyn, N. Y.	<i>Elijah W. Sackrider</i> , Cleveland, O.	<i>Charles A. Hewitt</i> , Lancaster, Pa.
Aug. 22, 1866.	Detroit, Mich.....	<i>Frederick Stearns</i> , Detroit, Mich.	<i>Edward Parrish</i> , Philadelphia.	<i>Ezekiel H. Sargent</i> , Chicago.	<i>John W. Shedden</i> , New York.
Sept. 10, 1867.	New York, N. Y.	<i>John Milbau</i> , New York.	<i>Robert J. Brown</i> , Leavenworth, Kan.	<i>N. Hynson Jennings</i> , Baltimore.	<i>Daniel Henchman</i> , Boston.
Sept. 8, 1868.	Philadelphia, Pa...	<i>Edward Parrish</i> , Philadelphia.	<i>Ferris Bringham</i> , Wilmington, Del.	<i>Edward S. Wayne</i> , Cincinnati.	<i>Albert E. Ebert</i> , Chicago.
Sept. 7, 1869.	Chicago, Ill.....	<i>Ezekiel H. Sargent</i> , Chicago.	<i>Ferdinand W. Senneca</i> , St. Louis.	<i>John H. Pope</i> , New Orleans.	<i>Joel S. Orne</i> , Cambridgeport, Mass.
Sept. 13, 1870.	Baltimore, Md....	<i>Richard H. Stabler</i> , Alexandria, Va.	<i>Fleming G. Grieve</i> , Milledgeville, Ga.	<i>James G. Steele</i> , San Francisco.	<i>Eugene L. Massot</i> , St. Louis.
Sept. 12, 1871.	St. Louis, Mo....	<i>Enno Sander</i> , St. Louis.	<i>C. Lewis Diehl</i> , Louisville, Ky.	<i>George F. H. Markoe</i> , Boston.	<i>Matthew F. Ash</i> , Jackson, Miss.
Sept. 3, 1872.	Cleveland, O.....	<i>Albert E. Ebert</i> , Chicago.	<i>Samuel S. Garrigues</i> , East Saginaw, Mich.	<i>Edward P. Nichols</i> , Newark, N. J.	<i>Henry C. Gaylord</i> , Cleveland, O.
Sept. 16, 1873.	Richmond, Va....	<i>John F. Hancock</i> , Baltimore.	<i>William Saunders</i> , London, Ont.	<i>John T. Buck</i> , Jackson, Miss.	<i>Paul Balluff</i> , New York.
Sept. 8, 1874.	Louisville, Ky....	<i>C. Lewis Diehl</i> , Louisville, Ky.	<i>Joseph Roberts</i> , Baltimore.	<i>William T. Wenzell</i> , San Francisco.	<i>Augustus R. Bayley</i> , Cambridgeport, Mass.
Sept. 7, 1875.	Boston, Mass.....	<i>George F. H. Markoe</i> , Boston.	<i>Frederick Hoffmann</i> , New York.	<i>T. Roberts Baker</i> , Richmond, Va.	<i>Christian F. G. Meyer</i> , St. Louis.
Sept. 12, 1876.	Philadelphia, Pa..	<i>Charles Bullock</i> , Philadelphia.	<i>Samuel A. D. Sheppard</i> , Boston.	<i>Gustavus J. Luhn</i> , Charleston, S. C.	<i>Jacob D. Wells</i> , Cincinnati.
Sept. 4, 1877.	Toronto, Can.....	<i>William Saunders</i> , London, Ont.	<i>Ewen McIntyre</i> , New York.	<i>John Ingalls</i> , Macon, Ga.	<i>Emilen Painter</i> , San Francisco.

LIST OF OFFICERS (Continued)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Nov. 26, 1878..	Atlanta, Ga.....	<i>Gustavus J. Luhn</i> , Charleston, S. C.	<i>Frederick T. Whiting</i> , Great Barrington, Mass.	<i>Henry J. Rose</i> , Toronto, Can.	<i>William H. Crawford</i> , St. Louis.
Sept. 9, 1879..	Indianapolis. Ind.	<i>George W. Sloan</i> , Indianapolis, Ind.	<i>T. Roberts Baker</i> , Richmond, Va.	<i>Joseph L. Lemberger</i> , Lebanon, Pa.	<i>Philip C. Candidus</i> , Mobile, Ala.
Sept. 14, 1880..	Saratoga, N. Y...	<i>James T. Shinn</i> , Philadelphia.	<i>George H. Schafer</i> , Fort Madison, Ia.	<i>William S. Thompson</i> , Washington, D. C.	<i>William Simpson</i> , Raleigh, N. C.
Aug. 23, 1881..	Kansas City, Mo. Niagara Falls,	<i>P. Wendover Bedford</i> , New York.	<i>Emlen Painter</i> , San Francisco.	<i>George Leis</i> , Lawrence, Kan.	<i>John F. Judge</i> , Cincinnati.
Sept. 12, 1882..	N. Y...	<i>Charles A. Heinitsh</i> , Lancaster, Pa.	<i>John Ingalls</i> , Macon, Ga.	<i>Louis Dohme</i> , Baltimore.	<i>William B. Blanding</i> , Providence, R. I.
Sept. 11, 1883..	Washington, D. C.	<i>William S. Thompson</i> , Washington, D. C.	<i>Charles Rice</i> , New York.	<i>Frederick H. Masi</i> , Norfolk, Va.	<i>Edward W. Runyon</i> , San Francisco.
Aug. 26, 1884..	Milwaukee, Wis...	<i>John Ingalls</i> , Macon, Ga.	<i>John A. Dadd</i> , Milwaukee, Wis.	<i>Henry Canning</i> , Boston.	<i>Charles F. Goodman</i> , Omaha, Neb.
Sept. 8, 1885..	Pittsburg, Pa.....	<i>Joseph Roberts</i> , Baltimore.	<i>Albert H. Hollister</i> , Madison, Wis.	<i>Albert B. Prescott</i> , Ann Arbor, Mich.	<i>Joseph S. Evans</i> , West Chester, Pa.
Sept. 7, 1886..	Providence, R. I..	<i>Chas. A. Tufts</i> , Dover, N. H.	<i>Henry J. Menninger</i> , Brooklyn, N. Y.	<i>M. W. Alexander</i> , St. Louis.	<i>Norman A. Kuhn</i> , Omaha, Neb.
Sept. 5, 1887..	Cincinnati, O.....	<i>John U. Lloyd</i> , Cincinnati.	<i>M. W. Alexander</i> , St. Louis.	<i>A. K. Finlay</i> , New Orleans,	<i>Karl Simmon</i> , St. Paul, Minn.
Sept. 3, 1888..	Detroit, Mich..... San Francisco,	<i>M. W. Alexander</i> , St. Louis.	<i>Jas. Vernor</i> , Detroit, Mich.	<i>Fred Wilcox</i> , Waterbury, Conn.	<i>Alvin A. Yeager</i> , Knoxville, Tenn.
June 24, 1889..	Cal.. Old Pt. Comfort,	<i>Emlen Painter</i> , New York.	<i>Karl Simmon</i> , St. Paul, Minn.	<i>Wm. M. Searby</i> , San Francisco.	<i>Jos. W. Eckford</i> , Aberdeen, Miss.
Sept. 8, 1890..	Va...	<i>A. B. Taylor</i> , Philadelphia.	<i>A. B. Stevens</i> , Ann Arbor, Mich.	<i>Chas. E. Dohme</i> , Baltimore.	<i>Jas. M. Good</i> , St. Louis.

LIST OF OFFICERS OF THE ASSOCIATION.

LIST OF OFFICERS (Continued)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents	Second Vice-Presidents	Third Vice-Presidents.
April 27, 1891...	New Orleans, La.	L. K. Finlay, New Orleans.	Geo. J. Seabury, New York.	W. H. Torbet, Dubuque, Ia.	L. T. Dunning, Sioux Falls, S. Dak.
July 14, 1892...	Profile House, N. H. }	Jos. P. Remington, Philadelphia.	A. P. Preston, Portsmouth, N. H.	Sidney P. Watson, Atlanta, Ga.	Wm. H. Averill, Frankfort, Ky.
Aug. 14, 1893...	Chicago, Ill. }	Edgar L. Patch, Boston.	Leo Eliel, South Bend, Ind.	Wiley Rogers, Louisville, Ky.	Chas. Caspari, Jr., Baltimore.
Sept. 3, 1894...	Asheville, N. C. }	William Simpson, Raleigh, N. C.	Chas. M. Ford, Denver, Colo.	Jno. N. Hurty, Indianapolis, Ind.	Jos. E. Morrison, Montreal, Can.
Aug. 14, 1895...	Denver, Colo. }	James M. Good, St. Louis.	Chas. E. Dohme, Baltimore.	Adolph Brandenberger, Jefferson City, Mo.	Mrs. M. O. Miner, Hiawatha, Kan.
Aug. 12, 1896...	Montreal, Can. }	Joseph E. Morrison, Montreal, Can.	Geo. F. Payne, Atlanta, Ga.	Wm. A. Frost, St. Paul, Minn.	Geo. W. Parisen, Perth Amboy, N. J.
Aug. 23, 1897...	Lake Minne- tonka, Minn. }	Henry M. Whitney, Lawrence, Mass.	George C. Bartells, Camp Point, Ill.	Wm. S. Thompson, Washington, D. C.	Jacob A. Miller, Harrisburg, Pa.
Aug. 29, 1898...	Baltimore, Md. }	Charles E. Dohme, Baltimore.	George F. Payne, Atlanta, Ga.	James H. Beal, Scio, O.	Miss Josie A. Wanous, Minneapolis, Minn.
Sept. 4, 1899...	Put-in-Bay, O. }	Albert B. Prescott, Ann Arbor, Mich.	Lewis C. Hopp, Cleveland, O.	Wm. L. Dewoody, Pine Bluff, Ark.	Henry R. Gray, Montreal, Can.
May 7, 1900...	Richmond, Va. }	Jno. F. Patton, York, Pa.	James H. Beal, Scio, O.	Jno. W. Gayle, Frankfort, Ky.	E. A. Ruddiman, Nashville, Tenn.
Sept. 16, 1901...	St. Louis, Mo. }	Henry M. Whelpley, St. Louis.	Wm. M. Scarby, San Francisco.	George F. Payne, Atlanta, Ga.	Wm. S. Thompson, Washington, D. C.
Sept. 8, 1902...	Philadelphia, Pa. }	Geo. F. Payne, Atlanta, Ga.	Wm. L. Cliffe, Philadelphia, Pa.	Eugene G. Eberle, Dallas, Tex.	Henry Willis, Quebec, Can.
Aug. 3, 1903...	Mackinac Island, Mich. }	Lewis C. Hopp, Cleveland, O.	Wm. C. Alpers, New York.	Albert M. Roehrig, Stapleton, N. Y.	Otto F. Claus, St. Louis, Mo.

LIST OF OFFICERS OF THE ASSOCIATION.

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LIST OF OFFICERS (Concluded)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 5, 1904..	Kansas City, Mo.	James H. Beal, Scio, O.	<i>Philip C. Candidus</i> , Mobile, Ala.	Wm. Mittelbach, Boonville, Mo.	Julius A. Koch, Pittsburg, Pa.
Sept. 4, 1905..	Atlantic City, N.J.	Jos. L. Lemberger, Lebanon, Pa.	Chas. Holzhauser, Newark, N. J.	Chas. A. Rapelye, Hartford, Conn.	Fabius C. Godbold, New Orleans, La.
Sept. 3, 1906..	Indianapolis, Ind.	<i>Leo Eliel</i> , South Bend, Ind.	Wm. Mittelbach, Boonville, Mo.	<i>C. S. N. Hallberg</i> , Chicago, Ill.	<i>Thomas P. Cook</i> , New York, N. Y.
Sept. 2, 1907..	New York, N. Y.	<i>Wm. M. Scarby</i> , San Francisco, Cal.	<i>Oscar Oldberg</i> , Chicago, Ill.	Henry H. Rusby, New York, N. Y.	Oscar W. Bethca, Meridian, Miss.
Sept. 7, 1908..	Hot Springs, Ark.	<i>Oscar Oldberg</i> , Chicago, Ill.	Eugene G. Eberle, Dallas, Tex.	Wm. Mittelbach, Boonville, Mo.	James H. Beal, Scio, O.
Aug. 16, 1909..	Los Angeles, Cal.	Henry H. Rusby, Newark, N. J.	Clement B. Lowe, Philadelphia, Pa.	Chas. W. Johnson, Seattle, Wash.	Wm. B. Day, Chicago, Ill.
May 2, 1910..	Richmond, Va....	Eugene G. Eberle, Dallas, Tex.	Wm. B. Day, Chicago, Ill.	Otto F. Claus, St. Louis, Mo.	Leonard A. Seltzer, Detroit, Mich.
Aug. 14, 1911..	Boston, Mass.....	John G. Godding, Boston, Mass.	W. Bodemann, Chicago, Ill.	Chas. M. Ford, Denver, Col.	Ernest Berger, Tampa, Fla.
Aug. 19, 1912..	Denver, Col.....	William B. Day, Chicago, Ill.	Chas. M. Ford, Denver, Col.	Caswell A. Mayo, New York, N. Y.	C. Herbert Packard, East Boston, Mass.

HONORARY PRESIDENTS.

Philip C. Candidus, Mobile, Ala., 1907-08. *Enno Sander*, St. Louis, Mo., 1909-1910.
Samuel A. D. Sheppard, Boston, Mass., 1908-09. *Ewen McIntyre*, New York, N. Y., 1910-1911.
Alfred B. Taylor, Philadelphia, 1852-54. *Askel Boyden*, Boston, 1859-60.
Samuel M. Colcord, Boston, 1854-56, and *Henry Haziland*, New York, 1860-63.
James S. Aspinwall, New York, 1856-57. *J. Brown Barclay*, Baltimore Md., 1863-65.

TREASURERS.

Charles A. Tufts, Dover, N. H., 1865-86.
Samuel A. D. Sheppard, Boston, 1886-1908.
Henry M. Wheelpley, St. Louis, 1908-1913.

RECORDING SECRETARIES.

George D. Coggeshall, New York, 1852-53. *Peter W. Bedford*, New York, 1862-63.
Edward Parrish, Philadelphia, 1853-54. *William Evans, Jr.*, Philadelphia, 1863-64.
Edward S. Wayne, Cincinnati, 1854-55. *Henry N. Rittenhouse*, Philadelphia, 1864-65.

CORRESPONDING SECRETARIES.

William Precter, Jr., 1852-53, and 1854-57.
William B. Chapman, Cincinnati, 1853-1854.
Edvard Parrish, Philadelphia, 1857-58.

John M. Maisch, Philadelphia, 1865-Sept., 1893.

Chas. Caspari, Jr., Baltimore, 1896-1911.

For the meeting held in

1867....*P. Wendover Bedford*.
 1868....*Alfred B. Taylor*.
 1869....*Henry W. Fuller*.
 1870....*J. Faris Moore*.
 1871....*William H. Craxford*.
 1872....*Henry C. Gaylord*.
 1873....*Thomas H. Hazard*.
 1874....*Emil Scheffer*.
 1875....*Samuel A. D. Sheppard*.
 1876....*Adolphus W. Miller*.
 1877....*Henry J. Rose*.
 1878....*Jesse W. Rankin*.
 1879....*Eli Lilly*.
 1880....*Charles F. Fish*.
 1881....*William T. Ford*.
 1882....*Hiram E. Griffith*.

Peter W. Bedford, New York, 1860-62, and 1863-65.

John M. Maisch, Philadelphia, 1862-63.

Joseph P. Remington, Philadelphia, 1893-94.
Chas. Caspari, Jr., Baltimore, 1894-96.

James H. Beal, Scio, Ohio, 1911-1913.

For the meeting held in

1898....*Henry P. Hynson*.
 1899....*Lewis C. Hopp*.
 1900....*T. Ashby Miller*.
 1901....*H. M. Whelpley*.
 1902....*William L. Cliffe*.
 1903....*F. W. R. Perry*.
 1904....*Joseph C. Wirthman*.
 1905....*William C. Westcott*.
 1906....*Frank H. Carter*.
 1907....*Thomas P. Cook*.
 1908....*Martin A. Eisle*.
 1909....*Thomas W. Jones*.
 1910....*T. Ashby Miller*.
 1911....*C. Herbert Packard*.
 1912....*Charles M. Ford*.
 1913....*James O. Burge*.

PERMANENT SECRETARIES.

Henry M. Whelpley, St. Louis (acting), August, 1893.

GENERAL SECRETARIES.

LOCAL SECRETARIES.

For the meeting held in

1883....*Charles Becker*.
 1884....*Henry C. Schranck*.
 1885....*George A. Kelly*.
 1886....*William B. Blanding*.
 1887....*George W. Foss*.
 1888....*James Vernor*.
 1889....*Edward W. Runyon*.
 1890....*Charles E. Dohme*.
 1891....*A. K. Finlay*.
 1892....*H. M. Whitney*.
 1893....*Henry Biroth*.
 1894....*W. G. Smith*.
 1895....*Edm. L. Scholtz*.
 1896....*Joseph E. Morrison*.
 1897....*Edw. Shumpik*.

REPORTERS ON PROGRESS OF PHARMACY.

C. L. Diehl, Louisville, Ky., 1873-91, and 1895-1912.

Chas. Rice, New York, N. Y., 1891-92.

Henry Kraemer, Philadelphia, Pa., 1892-93.

PAST AND PRESENT OFFICERS OF THE SECTIONS.

SECTION ON COMMERCIAL INTERESTS.		SECTION ON SCIENTIFIC PAPERS.	
<i>Chairman.</i>	<i>Secretary.</i>	<i>Chairman.</i>	<i>Secretary.</i>
1887-88..... <i>A. H. Hollister.</i>	<i>J. W. Colcord.</i>	1887-88..... <i>T. Roberts Baker.</i>	<i>A. B. Lyons.</i>
1888-89....." "	" "	1888-89..... <i>Emilen Painter.</i>	<i>H. M. Whelpley.</i>
1889-90..... <i>Leo Eliel</i>	<i>F. B. Kilmer.</i>	1889-90..... <i>H. M. Whelpley.</i>	<i>C. F. Dare.</i>
1890-91..... <i>Henry Canning.</i>	<i>W. L. Dewoody.</i>	1890-91..... <i>F. L. Patch.</i>	<i>C. S. N. Hallberg.</i>
1891-92..... <i>W. H. Torbert.</i>	<i>Arthur Bassett.</i>	1891-92..... <i>C. S. N. Hallberg.</i>	<i>H. W. Snow.</i>
1892-93....." "	" "	1892-93..... <i>C. T. P. Fennel.</i>	<i>F. G. Ryan.</i>
1893-94..... <i>Wiley Rogers.</i>	<i>Jas. O. Burge.</i>	1893-94..... <i>L. E. Sayre.</i>	<i>C. M. Ford.</i>
1894-95..... <i>Geo. J. Seabury.</i>	" "	1894-95..... <i>A. R. L. Dohme.</i>	<i>George B. Kauffman.</i>
1895-96....." "	<i>Clay W. Holmes.</i>	1895-96..... <i>S. P. Sadtler.</i>	<i>W. C. Alpers.</i>
1896-97..... <i>Lewis C. Hopp.</i>	<i>E. D'Avignon.</i>	1896-97..... <i>W. C. Alpers.</i>	<i>V. Coblentz.</i>
1897-98..... <i>Joseph Jacobs.</i>	<i>Jas. H. Bobbitt.</i>	1897-98..... <i>Edward Kremers.</i>	<i>A. B. Lyons.</i>
1898-99....." "	" "	1898-99..... <i>Henry H. Rusby.</i>	<i>H. V. Army.</i>
1899-00..... <i>James M. Good.</i>	<i>Charles A. Rapelye.</i>	1899-00..... <i>Frank G. Ryan.</i>	<i>Caswell A. Mayo.</i>
1900-01..... <i>Charles A. Rapelye.</i>	<i>F. W. Meissner.</i>	1900-01..... <i>Oscar Oldberg.</i>	<i>Lyman F. Kebler.</i>
1901-02..... <i>F. W. Meissner.</i>	<i>E. G. Eberle.</i>	1901-02..... <i>Lyman F. Kebler.</i>	<i>Jos. W. England.</i>
1902-03..... <i>Thomas V. Wooten.</i>	<i>Wm. C. Anderson.</i>	1902-03..... <i>J. O. Schlotterbeck.</i>	" "
1903-04..... <i>Wm. L. Dewoody.</i>	<i>Robert C. Reilly.</i>	1903-04..... <i>William A. Puckner.</i>	<i>Eustace H. Gane.</i>
1904-05..... <i>Charles R. Sherman.</i>	" "	1904-05..... <i>Eustace H. Gane.</i>	<i>Charles E. Caspari.</i>
1905-06..... <i>Henry P. Hynson.</i>	<i>Herman D. Kniseley.</i>	1905-06..... <i>Charles E. Caspari.</i>	<i>Daniel Base.</i>
1906-07..... <i>Herman D. Kniseley.</i>	<i>Charles H. Avery.</i>	1906-07..... <i>Reid Hunt.</i>	<i>Virgil Coblentz.</i>
1907-08..... <i>Jacob Diner.</i>	<i>George O. Young.</i>	1907-08..... <i>Virgil Coblentz.</i>	<i>Chas. E. Vanderkleed.</i>
1908-09..... <i>Harry B. Mason.</i>	<i>Erich H. Ladish.</i>	1908-09..... <i>Chas. E. Vanderkleed.</i>	<i>Martin I. Wilbert.</i>
1909-10..... <i>Waldo M. Bowman.</i>	<i>G. H. P. Lichthardt.</i>	1909-10..... <i>Martin I. Wilbert.</i>	<i>Albert H. Clark.</i>
1910-11..... <i>Franklin M. Apple.</i>	<i>Benj. E. Pritchard.</i>	1910-11..... <i>Albert H. Clark.</i>	<i>Wm. O. Richtmann.</i>
1911-12..... <i>Ernest Berger.</i>	<i>D. W. Ramsaur.</i>	1911-12..... <i>W. O. Richtmann.</i>	<i>Charles H. LaWall.</i>
1912-13..... <i>Autumn V. Pease.</i>	<i>William R. White.</i>	1912-13..... <i>Frank R. Eldred.</i>	<i>Freeman P. Stroup.</i>

SECTION ON PHARMACEUTICAL EDUCATION.		SECTION ON PHARMACEUTICAL LEGISLATION.	
<i>Chairman.</i>		<i>Secretary.</i>	
1887-88.....	<i>John F. Judge.</i>	1887-88.....	R. F. Bryant.
1888-89.....	<i>P. W. Bedford.</i>	1888-89.....	C. W. Day.
SECTION ON PHARMACEUTICAL EDUCATION AND LEGISLATION.		SECTION ON PRACTICAL PHARMACY AND DISPENSING.	
<i>Chairman.</i>		<i>Secretary.</i>	
1889-90.....	<i>P. W. Bedford.</i>	1900-01.....	Henry P. Hynson.
1890-91.....	William Simon.	1901-02.....	F. W. E. Stedem.
1891-92.....	A. B. Stevens.	1902-03.....	George M. Beringer.
1892-93.....	R. G. Eccles.	1903-04.....	<i>William H. Burke.</i>
1893-94.....	"	1904-05.....	Charles A. Rapelye.
1894-95.....	James M. Good.	1905-06.....	William C. Alpers.
1895-96.....	<i>C. S. N. Hallberg.</i>	1906-07.....	H. A. Brown Dunning.
1896-97.....	"	1907-08.....	Franklin M. Apple.
1897-98.....	James H. Beal.	1908-09.....	Leonard A. Seltzer.
1898-99.....	A. B. Lyons.	1909-10.....	Otto Raubenheimer.
1899-00.....	C. B. Lowe.	1910-11.....	Louis Saalbach.
1900-01.....	"	1911-12.....	P. Henry Utech.
1901-02.....	E. G. Eberle.	1912-13.....	J. Leon Lascoff.
1902-03.....	J. W. T. Knox.	SECTION ON HISTORICAL PHARMACY.	
1903-04.....	Harry B. Mason.	<i>Chairman.</i>	
1904-05.....	"	1904-05.....	<i>Albert E. Ebert.</i>
1905-06.....	<i>Oscar Oldberg.</i>	1905-06.....	John F. Hancock.
1906-07.....	"	1906-07.....	<i>Even McIntyre.</i>
1907-08.....	Jos. W. England.	1907-08.....	Edward V. Howell.
1908-09.....	"	1908-09.....	John B. Bond.
1909-10.....	Charles H. LaWall.	1909-10.....	Eugene G. Eberle.
1910-11.....	Charles W. Johnson.	1910-11.....	Joseph L. Lemberger.
1911-12.....	John C. Wallace.	1911-12.....	Otto Raubenheimer.
1912-13.....	Wilber J. Teeters.	1912-13.....	John G. Godding.
SECTION ON PHARMACOPOEIAS AND FORMULARIES.		WOMEN'S SECTION.	
1912-13.....	L. D. Havenhill.	1912-13.....	Mrs. John G. Godding.
			Miss Anna G. Bagley.

OFFICERS OF THE COUNCIL SINCE ITS FIRST ORGANIZATION.

	<i>Chairman.</i>	<i>Vice-Chairman.</i>	<i>Secretary.</i>
1880-81.....	Jos. P. Remington.	<i>Joseph Roberts.</i>	<i>George W. Kennedy.</i>
1881-82.....	"	<i>Wm. J. M. Gordon.</i>	"
1882-83.....	"	"	"
1883-84.....	"	C. Lewis Diehl.	"
1884-85.....	"	<i>John A. Dadd.</i>	"
1885-86.....	"	C. Lewis Diehl.	"
1886-87.....	<i>Wm. S. Thompson.</i>	<i>H. J. Menninger.</i>	"
1887-88.....	Wm. H. Rogers.	Karl Simmon.	"
1888-89.....	Jas. M. Good.	<i>Emlen Painter.</i>	"
1889-90.....	"	<i>Wm. S. Thompson.</i>	"
1890-91.....	"	"	"
1891-92.....	"	"	"
1892-93.....	"	<i>H. M. Whitney.</i>	"
1893-94.....	"	"	"
1894-95.....	<i>Wm. S. Thompson.</i>	"	"
1895-96.....	"	Wm. C. Alpers.	"
1896-97.....	"	Jas. M. Good.	"
1897-98.....	"	"	"
1898-99.....	"	"	"
1899-00.....	"	"	"
1900-01.....	"	"	"
1901-02.....	<i>A. B. Prescott.</i>	<i>Chas. E. Dohme.</i>	"
1902-03.....	James H. Beal.	Lewis C. Hopp.	Henry M. Whelpley.
1903-04.....	"	<i>Leo Eliel.</i>	"
1904-05.....	"	Jos. L. Lemberger.	"
1905-06.....	"	Wm. C. Alpers.	"
1906-07.....	"	Albert M. Roehrig.	"
1907-08.....	"	"	"
1908-09.....	Jos. P. Remington.	<i>Wm. M. Searby.</i>	Joseph W. England.
1909-10.....	Fabius C. Godbold.	Julius A. Koch.	"
1910-11.....	James H. Beal.	Henry H. Rusby.	"
1911-12.....	Eugene G. Eberle.	James M. Good.	"
1912-13.....	Eugene G. Eberle.	Fabius C. Godbold.	"

CONSTITUTION AND BY-LAWS

OF THE

American Pharmaceutical Association

CONSTITUTION

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market by preventing the importation of inferior, adulterated, or deteriorated drugs and by detecting and exposing home adulterations.

2. To encourage such proper relations among Druggists, Pharmacists, Physicians and the people at large, as may promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a General Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom shall be elected annually; also a Local Secretary to be elected by the Council. They shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the interest of which for any current year only may be used by the Association for its expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be submitted in writing, and may be balloted for at the next Annual Meeting, when, upon receiving the votes of three-fourths of the members present, it shall become a part of this Constitution. Any proposition to amend the Constitution for the purpose of permitting the expenditure of the permanent invested funds of the Association, shall require a majority of seven-eighths for its passage.

BY-LAWS

CHAPTER I.

Of the Election of Officers.

ARTICLE I. A Nominating Committee shall be annually chosen, whose duty it shall be annually, at the meeting, to select candidates for the offices of President, three Vice-Presidents and three members of the Council.

ARTICLE II. The Nominating Committee shall submit the names of three persons as candidates for each of the offices of President, First Vice-President, Second Vice-President, Third Vice-President, and three members of the Council. These names are to be submitted by the General Secretary by mail to every member of the Association, together with a request that the member indicate his preference on a ballot enclosed for that purpose, and return the same by mail within one month after the adjournment of the annual meeting.

ARTICLE III. The ballots received as indicated in the preceding article are to be sent by the General Secretary to a Board of Canvassers, composed of three members to be appointed by the President, who shall count as votes in the annual election only the votes of those members whose dues have been paid for the current year, and who in turn shall certify to the General Secretary the result of the election, after which the latter shall be published in the JOURNAL of the Association.

ARTICLE IV. The officers thus elected by a plurality of the votes cast shall be installed at the final general session of the next annual meeting.

ARTICLE V. The Honorary President, Reporter on the Progress of Pharmacy, the Treasurer and the General Secretary shall be elected annually by the Council.

CHAPTER II.

Of the Presidents and Vice-Presidents.

ARTICLE I. The President shall preside at all general sessions of the Association, except those of the special Sections, as hereinafter provided. In the event of his absence or inability to serve, one of the Vice-Presidents, or in the absence of all a President *pro tempore*, shall perform the duties of President.

ARTICLE II. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*.

ARTICLE III. At the sessions the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports

and communications, and order the vote upon all proper questions at the proper time.

ARTICLE IV. In all balloting, and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal; and in case of such equal division, the motion is lost.

ARTICLE V. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality and impropriety he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in case where he prefers to submit the matter to the members; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

ARTICLE VI. He shall have the right to call a member to the chair, in order that he may take the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

ARTICLE VII. He shall appoint all committees, not provided for in the By-Laws or otherwise directed by the Association.

ARTICLE VIII. He shall sign the certificates of membership, and counter-sign all orders on the Treasury. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE IX. He shall present at each annual meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

CHAPTER III.

Of the General Secretary.

ARTICLE I. The General Secretary shall be elected annually and shall receive from the Treasurer an annual salary not to exceed \$1200, and the amount of his expenses incident to the meeting, in addition to his salary.

He shall give bond for the proper disposition of the funds of the Association which may come into his hands, in such amount as may be prescribed by the Council.

ARTICLE II. He shall keep fair and correct minutes of the proceedings of the general sessions, and carefully preserve, on file, all reports, essays, and papers of every description presented to the Association, and shall be charged with the necessary foreign and scientific correspondence, and with editing, publishing, and distributing the Report on the Progress of Pharmacy, under the direction of the Council.

ARTICLE III. He shall read all papers handed him by the President for that purpose, shall call and record the ayes and nays, whenever they are required to be called; shall notify the chairman of every standing and special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act.

CHAPTER IV.

Of the Local Secretary.

ARTICLE I. The Local Secretary shall reside at or near the place where the next annual meeting of the Association is to be held.

ARTICLE II. He shall assist the General Secretary in his duties; shall co-operate with the Council and any Local Committee in making arrangements for the annual meeting; shall correspond with the chairmen of the several committees, and with other members, in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers, and apparatus destined for use or exhibition at the meetings.

ARTICLE III. An exhibition of objects interesting to pharmacists, may be held each year, should the Council so determine, under the direction of the Local Secretary and the Committee on Commercial Interests.

CHAPTER V.

Of the Treasurer.

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the General Secretary, accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each annual meeting, the names of such members as have failed to pay their annual dues for three years.

ARTICLE IV. He shall present a statement of his accounts at each annual meeting of the Council, that they may be audited; he shall receive an annual salary not to exceed \$1,000, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE V. The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds to the amount of \$15,000 with the Chairman of the Council for the faithful performance of his duties as Treasurer, this bond or bonds to be signed and executed by a Trust Company acceptable to the Council.

CHAPTER VI.

Of the Reporter on the Progress of Pharmacy.

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services an annual salary not to exceed \$1,200.

ARTICLE II. All journals and volumes received in exchange for the Report on the Progress of Pharmacy by the General Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the General Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry and Materia Medica, and the collateral branches of knowledge; together with such data as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall be edited, published and distributed under rules and regulations approved by the Council. It shall be issued as a yearly volume, covering each fiscal year of the Association.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the General Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

CHAPTER VII.

Of the Council.

ARTICLE I. The business of the Association which is not of a scientific character shall be in charge of a Council, which is empowered to transact business for the Association between the times of meeting, to reduce any appropriations that have been made, whenever in their judgment the current receipts are not sufficient to allow the expenditure, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association. Any member of the Association may attend the meetings of the Council, and may, by vote of the Council, be permitted to speak on any subject under discussion.

ARTICLE II. The Council shall consist of *ex-officio* members; one member from each local branch of this Association and nine other members, selected from such members as have had at least three years' membership in this Association, shall be elected by ballot by the Association in the following order: Three of them to serve for one year, three for two years, three for three years. At each subsequent annual meeting, three members shall be elected to take the place of those whose terms will then expire, to serve for the term of three years.

ARTICLE III. The President, Vice-Presidents, General Secretary, Local Secretary, Treasurer, Reporter on the Progress of Pharmacy, Editor-in-chief of the JOURNAL, the Chairmen of the Sections of the Association, the Secretary of the Council, and the Historian of the Association shall be *ex-officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and a Secretary, to be elected by ballot annually by the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the

Association from one annual meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the annual meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, two standing committees of the Council—a Committee on Publication, and a Committee on Finance—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

Whenever deemed advisable by the Council, it shall after the publication of each edition of the National Formulary appoint a committee of fifteen members from the general membership of the Association, which committee shall have charge of the revision of the Formulary. This committee shall report annually or as often as required to the Council and shall continue to serve until the edition for which it was appointed has been completed. Vacancies occurring in this committee shall be filled by the Council as quickly as is expedient.

ARTICLE VIII. *Section 1.* The Council shall have charge of the revision of the roll of members, and the editing, publication and distribution of all the publications of the Association.

Section 2. The Secretary of the Council shall read at each of its sessions the names of those candidates for membership which have been proposed, when a vote of two-thirds shall be sufficient to recommend them to the Association.

Section 3. The Council shall decide upon any objections which may be presented to them (which must be in writing, with the member's name attached), referring to the fitness of the candidates for membership; and no name shall be voted on by the Association without first receiving the approval of the Council.

ARTICLE IX. The Council shall furnish to each member of the Association, not in arrears, one copy of the Report on the Progress of Pharmacy, which publication shall contain, in addition to the report, a list of the officers and committees, prefatory matter, constitution and by-laws, general rules, roll of members, list of members, and such other matter as may be deemed desirable by the Council. It shall fix, also, the price for which copies of the Report may be sold.

ARTICLE X. The Council shall issue a monthly JOURNAL, beginning in January, 1912, and thereafter under rules and regulations to be adopted by the Council, and shall furnish copies of such publication to each member of the Association not in arrears for subscription. The publication shall contain editorials, original articles, the proceedings of the annual meetings of the Council, and of the branches, and such other matter as may be deemed desirable by the Council.

CHAPTER VIII.

Of Membership.

ARTICLE I. Every pharmacist and druggist of good moral and professional standing whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Chemistry and Botany,

who may be especially interested in Pharmacy and Materia Medica, also editors and publishers of pharmaceutical journals, who, after duly considering the objects of the Association and the obligations of the Constitution and By-laws, subscribe to them, are eligible to membership; provided that any person whose name has been dropped from the roll of members for non-payment of dues may be readmitted after having again made application in regular form, the application being accompanied by the usual fee; or he may be readmitted, without such application, on payment of all back dues; in the latter case his membership shall date from the time when he first joined the Association, as previously printed in the Roll of Members, and notice of such action shall be inserted in the addendum to the Treasurer's report.

ARTICLE II. Every application for membership shall require the endorsement of two members of the Association in good standing, and each applicant must receive the affirmative vote of three-fourths of the members of the Council for election, after which his membership shall be completed by his signing the Constitution and By-Laws and paying the annual dues for the current year. Any newly-elected member, upon the payment of the annual dues for the year in which he is elected, shall be entitled to the annual volume of the Report on the Progress of Pharmacy and such other publications of the Association as are distributed to its members free of charge during the year. Any application for membership made during the fiscal year (the calendar year shall be the fiscal year of the Association) shall apply to the current fiscal year; except between June and January, when, if desired, it can be made to apply to the next fiscal year, if so stated on the application. The publications will be sent for the fiscal year in which the dues and subscription are credited.

The price for the Report on the Progress of Pharmacy to non-members shall be fixed by the Council. The subscription price for the JOURNAL of the Association shall be four dollars per annum to members and non-members alike. The subscription to the JOURNAL must be separate and distinct from the annual dues, although both may be paid at one and the same time.

ARTICLE III. Every member shall pay in advance to the Treasurer the sum of four dollars as annual dues, and by neglecting to pay said contribution for six successive months, may be dropped from the roll of members. If the annual dues (four dollars) and the annual subscription to the JOURNAL be paid at one and the same time, a reduction of three dollars shall be allowed.

ARTICLE IV. Any member of the Association who shall pay to the Treasurer the sum of \$100.00 during the first year of his connection therewith, and also any member not in arrears, who after ten years shall pay the sum of \$75.00, or after fifteen years the sum of \$50.00, or after twenty years the sum of \$40.00, or after twenty-five years the sum of \$25.00, and any member who may have paid annual dues for thirty-seven consecutive years, shall become a life-member, and shall be exempt from all future annual contributions.

ARTICLE V. All local organizations of Pharmacists shall be entitled to five delegates as their representatives in the annual meetings, who, if present, become members of the Association on signing the Constitution and paying the

annual contribution for the current year: Provided, that the provisions of this article shall not be so construed as to reinstate any member whose name shall have been dropped from the roll for non-payment of dues; nor shall any one who has been expelled from the Association be received as a delegate. All credentials shall be sent to the General Secretary at least two weeks in advance of the annual meeting.

ARTICLE VI. Members shall be entitled, on the payment of Three Dollars or of Five Dollars, to receive from the Treasurer respectively a paper or parchment certificate of membership signed by the President, one Vice-President, the General Secretary, and the Treasurer.

ARTICLE VII. Resignations of membership shall be made in writing to the General Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council.

ARTICLE VIII. Any member may be expelled for improper conduct, or the violation of the Constitution, By-Laws, or Ethics, adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at a general session.

ARTICLE IX. Pharmacists, chemists, and other scientific men who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office or vote at the meetings.

CHAPTER IX.

Of Meetings and Sections.

ARTICLE I. The meetings shall be held annually: Provided, that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. To expedite and render more efficient the work of the Association, five Sections shall be formed, as follows: 1, Section on Scientific Papers; 2, Section on Commercial Interests; 3, Section on Practical Pharmacy and Dispensing; 4, Section on Pharmaceutical Legislation and Education; 5, Section on Historical Pharmacy.

ARTICLE III. The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions to which they are especially assigned.

ARTICLE IV. The first, second and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read the minutes of Council, act on the report of Council on membership, and receive propositions for amendments to the By-Laws.

ARTICLE V. A Chairman and a Secretary shall be elected by ballot by each section (except the Scientific Section which elects its officers in accord with

the by-laws of said Scientific Section) to serve at the sessions of said Section. The minutes of each session, together with all documents and papers which belong to each Section, must be placed as soon as possible in the hands of the General Secretary for publication and safe-keeping.

ARTICLE VI. The Chairman of each Section (except the Scientific Section whose officers act in accord with the by-laws of said Scientific Section) shall preside at each of its sessions, and shall prepare a short address treating upon the subjects connected with his Section, to be read before the Section at the annual meeting.

ARTICLE VII. The officers of the Section on Commercial Interests shall be charged with the work of arranging in advance the business to come before the Section at the next annual meeting; shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual meeting of this Association shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE VIII. The officers of the Section on Practical Pharmacy and Dispensing, composed of members actually engaged in the retail drug business, shall arrange in advance the business to come before the Section at the next annual meeting; shall propose a series of subjects for general discussion, and solicit papers on subjects pertaining to the actual practice of pharmacy in retail stores.

ARTICLE IX. The officers of the Section on Pharmaceutical Legislation and Education shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines; shall report at each stated meeting of the Association what legislation on pharmaceutical subjects has occurred during the year; shall arrange the business of the Section in advance of its sessions, propose suitable subjects for discussion, and shall attend to such duties as may be delegated to them by the Section; shall propose each year a subject for discussion at the meetings of the State Associations, and, at the following annual meeting of this Association, shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE X. The officers of the Section on Historical Pharmacy shall arrange the business of the Section and shall present annually matters of special historical interest in pharmacy; and shall also secure the collection of letters, papers, etc., written by members of the Association, which when so collected shall remain in the custody of the committee and be available for reference to any one interested.

ARTICLE XI. The order of business at the first session of each annual meeting shall be as follows:

Section 1. Promptly at the time named in the notice issued for the meeting, the President, or, in his absence, one of the Vice-Presidents, or, in their absence, a President *pro tempore*, shall officiate.

Section 2. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the General Secretary until his arrival.

Section 3. Nineteen members shall constitute a quorum for the transaction of business.

Section 4. The President's address may then be read, after which the Council shall report the list of properly accredited delegates.

Section 5. Reports of Committees shall be presented, read by their titles, synopsis or in full, and laid on the table for future consideration.

Section 6. The minutes of the Council shall be read in full at the annual meeting of the Association, and its acts, if approved, shall be sustained by a vote of the majority of the members present; or, if disapproved by a majority of the members present, its acts shall be revised, so as to be acceptable to the Association.

Section 7. The President shall call the roll of States, the Territories, District of Columbia and the Provinces of Canada, requesting the members present from each State or Territory to appoint two members, the persons so selected to act as a Committee to nominate officers for the Association, and members of the Council for the ensuing three years; in addition to which the President shall appoint five members from the Association at large to act with the Committee. Delegates who are not members must complete their membership before they are eligible to serve on the Nominating Committee.

Section 8. Incidental business.

ARTICLE XII. The order of business at the second general session at each annual meeting shall be as follows:

Section 1. The President shall call the Association to order.

Section 2. The Secretary shall read the minutes of the preceding session, which may be amended, if necessary, and shall then be approved.

Section 3. The Report of the Committee on Nominations shall be read.

Section 4. Reading of the Minutes of the Council.

Section 5. Reading of the Reports of the Treasurer and General Secretary.

Section 6. Reports of Standing Committees shall be read.

Section 7. Reports of Special Committees shall be read.

Section 8. Incidental business.

Section 9. Adjournment subject to the call of the President.

ARTICLE XII. The order of business for the sessions of the Sections shall be determined by each Section for itself.

ARTICLE XIV. No money shall be appropriated from the Treasury by any of the Sections.

ARTICLE XV. At the last general session of the Association the newly-elected officers of the Association shall take their respective places.

ARTICLE XVI. The Council may arrange for such social sessions, to be held after the adjournment of the last general session, as it may deem expedient, but no business of the Association can be transacted at these social sessions.

CHAPTER X.

Of Committees.

ARTICLE I. There shall be appointed or elected six Standing Committees as follows: a Committee on the U. S. Pharmacopœia and a Committee on

Transportation, each to consist of ten members; a Committee on the Pharmaceutical Syllabus, to consist of seven members; a Committee on the Time and Place of Meeting; a Committee on Ebert Prize, and a Committee on General Prizes, each to consist of three members.

ARTICLE II. Any person desiring to submit a paper to the Association shall present to the Chairman of the particular Section to which it refers, at least ten days prior to the meeting, an abstract of said paper, indicative of its contents, and consisting of not less than fifty nor more than two hundred words.

This abstract shall be printed as a part of the program. The paper itself must be submitted to the officers of the Section previous to the first session. Not more than ten minutes shall be allowed for the presentation of any paper, unless by unanimous consent of the Section. This does not apply to the Scientific Section, which handles its papers in accord with the By-Laws of said Scientific Section.

All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publications than those of the Association, except by the consent of the Committee on Publication.

ARTICLE III. The Committee on the Ebert Prize, which shall be appointed by the Chairman of the Scientific Section, shall, at the next annual meeting after the one at which essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all respects it shall be governed by the stipulations expressed by the donor.

ARTICLE IV. The Committee on General Prizes, which shall be appointed by the President, shall, at the next annual meeting after the one at which the papers are presented, determine which, if any of them, are worthy of prizes, and decide upon the relative merits of such papers as are deemed worthy.

ARTICLE V. The Committee on the United States Pharmacopœia shall be appointed by the President of the Association, as follows: One member to be appointed for ten years and one for nine, eight, seven, six, five, four, three, two and one years respectively, each vacancy occurring by expiration of term to be filled by a new appointment for ten years. The Committee shall elect its own Chairman annually. It shall collect statistics regarding the frequency with which official and non-official remedies are used in legitimate practice, and shall endeavor to ascertain the general wishes and requirements of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopœia. It shall also note errors of any kind found in the U. S. Pharmacopœia so as to facilitate and aid the work of the National Committee on Revision of the U. S. P.

ARTICLE VI. The Committee on Transportation, which shall be elected by the Council, shall consist of one member each from the cities of Boston, New York, Chicago, St. Louis, Cincinnati, New Orleans, Atlanta, St. Paul or Minneapolis, Denver, Baltimore, Cleveland and San Francisco, and in conjunction with the General Secretary and the Local Secretary, who shall be members of the Committee, shall arrange for transportation from the different sections of the United States and Canada to the place of meeting and return. The Council shall annually elect the Chairman of this Committee.

ARTICLE VII. The Committee on the Pharmaceutical Syllabus shall be appointed by the President of the Association as follows: One member shall be appointed for seven years, and one for six, five, four, three, two and one years respectively; each vacancy occurring from expiration of term shall be filled for a term of seven years; other vacancies shall be filled at the annual meetings of the Association for the unexpired terms. This committee shall report to the Association through the Section on Pharmaceutical Legislation and Education, shall be members of the National Committee on the Pharmaceutical Syllabus and shall recommend to the Association its proportionate share of the current expenses.

CHAPTER XI.

Rules of Order and Debate.

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the assembly and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order named. A motion to adjourn shall be decided without debate.

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the yeas and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

ARTICLE V. On all points of order not covered in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

CHAPTER XII.

Local Branches.

ARTICLE I. Local branches of this Association may be formed whenever it may appear that twenty-five members of this Association, in good standing, will participate, provided that no more than one such branch shall be formed in any one state, province, district or territory, unless the additional branches shall be formed at a point distant one hundred miles or more from any branch already established in the same state, province, district or territory.

ARTICLE II. All active or voting members of local branches must be members of this Association in good standing.

ARTICLE III. The objects and aims of local branches of this Association shall be the same as set forth in Article I of the Constitution of this body, and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it. And no local branch shall

enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association.

ARTICLE IV. Each local branch having twenty-five active or voting members shall be entitled to elect one member every three years, who shall become and continue a member of the Council of this Association for that time.

CHAPTER XIII.

Miscellaneous.

ARTICLE I. Every proposition to alter or amend these By-Laws shall be submitted in writing at a general session, and may be balloted for at any subsequent general session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-Laws.

BY-LAWS OF THE COUNCIL

CHAPTER I.

ARTICLE I. The officers of the Council shall consist of a Chairman, a Vice-Chairman and a Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices after the election of new members of the Council by the Association.

CHAPTER II.

Of the Chairman and Vice-Chairman.

ARTICLE I. The Chairman shall preside at all meetings of the Council; in his absence or on account of inability from any cause, the Vice-Chairman, or, in the absence of both, a Chairman *pro tempore*, shall perform the duties of Chairman.

ARTICLE II. The Chairman of the Council shall confer with the Chairmen of the various special and standing committees of the Association, during its sessions, in order to arrange and expedite the business of the Association.

CHAPTER III.

Of the Secretary.

ARTICLE I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary not to exceed \$300.

ARTICLE II. He shall read all the papers handed him by the Chairman for that purpose; shall call and record the yeas and nays whenever they are re-

quired to be called; he shall notify the Chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting of the Council.

CHAPTER IV.

Of Committee on Publication.

ARTICLE I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council, together with the Editor-in-chief of the JOURNAL, the General Secretary, the Reporter on the Progress of Pharmacy and the Treasurer as *ex-officio* members. The Council shall elect the Chairman.

ARTICLE II. The Committee on Publication shall have charge of the editing, publication and distribution of the Report on the Progress of Pharmacy and the JOURNAL of the Association, and such other publications as may be issued, under rules and regulations to be approved by the Council.

ARTICLE III. The Editor-in-chief of the JOURNAL shall be elected annually, and shall receive from the Treasurer for his services such compensation as the Council may direct.

ARTICLE IV. The Editor-in-chief of the JOURNAL shall have charge of the editing, publication and distribution of the JOURNAL subject to the rules and regulations of the Committee on Publication.

ARTICLE V. In case of illness or other inability of the Editor-in-chief to carry on the work of the JOURNAL, the Committee on Publication shall be authorized to make the best arrangements possible to continue the work.

CHAPTER V.

Of Committee on Finance.

ARTICLE I. The Finance Committee shall consist of three members and shall, each year, previous to January 1, present to the Council for its consideration a list of appropriations to cover the various expenditures of the ensuing fiscal year. No payment shall be made in excess of any of the said appropriations, except by a special vote of the Council. Provided, however, that the Treasurer is authorized to transfer from one appropriation account to another such amount as may be needed at any time, the amount of any such transfer not to exceed the sum of fifty (\$50.00) dollars.

All motions and resolutions involving the expenditure of any sum in excess of \$25.00 shall have the approval of the Finance Committee before being acted upon by the Council.

All appropriations made for any fiscal year shall lapse at the end of the said fiscal year. Provided, however, that accounts properly chargeable against any of said appropriations prior to their expiration, but not received by the General Secretary until after the end of the fiscal year, may be paid from such appropriation, in case the warrant for such payment be drawn not later than twenty days after the expiration of the said fiscal year.

CHAPTER VI.

Of the Centennial Fund.

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and of the General Secretary. It shall receive applications in writing from members for grants from the interest derived from the Centennial Fund, the applications to be accompanied by a statement of the investigation to be made, and of the amount and cost of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. The Committee shall consider these applications, and at as early a date as possible shall report to the Council an outline of the proposed investigations, together with such recommendations of grants from the available funds as it may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and in case the grants be approved, the Chairman of the Council shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

CHAPTER VII.

Of Sessions.

ARTICLE I. The Council shall meet previous to the assembling of the Association, and at such other times as it may determine, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council, a special session shall be called.

ARTICLE III. Nine members of the Council shall constitute a quorum.

ARTICLE IV. The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman, and the Secretary.
2. Election of the Standing Committees of Council, as follows:
 - a. Committee on Finance, three members.
 - b. Committee on Publication, five members.
 - c. Committee on Centennial Fund, three members.
3. Unfinished and deferred business from the last Council, or such business as is especially referred to the Council from the Association.
4. The reading of the names of new members as provided in the By-Laws.
5. Reading of reports and appointment of committees.
6. New business.
7. Adjournment—and before the final adjournment, the minutes of the last session of the Council shall be read and approved.

CHAPTER VIII.

Miscellaneous.

ARTICLE I. Three members of any of the Standing Committees shall constitute a quorum for the transaction of business.

ARTICLE II. In all questions arising before the Council or its Committees, and which can be disposed of by a positive or negative vote, the Chairman of the Council, or the Chairman of the Committee, may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if the members had been personally present, a majority of the votes cast being considered sufficient to decide a question. The ayes and nays of such votes taken by the Council shall be entered upon the minutes.

ARTICLE III. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at the next session of the Council, when upon receiving the vote of three-fourths of the members present, it shall become a part of these By-Laws.

BY-LAWS OF THE SCIENTIFIC SECTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

SECTION I.

NAME.

ARTICLE I. This organization shall be known as the Scientific Section of the American Pharmaceutical Association.

SECTION II.

MEMBERSHIP.

ARTICLE I. All members of the American Pharmaceutical Association in good standing, who express a desire to do so, by registering their names with the Secretary of the Section, shall become members of the Section.

SECTION III.

OFFICERS.

ARTICLE I. The officers of the Section shall be a Chairman, a First Vice-Chairman, a Second Vice-Chairman and a Secretary, selected from members of the Section.

SECTION IV.

ELECTION OF OFFICERS.

ARTICLE I. The Charman of the Section shall at the first session appoint a committee of three, who shall report to the Section at the same session two names for each office. At the last session of the Section these names shall be balloted upon, and the one receiving a majority for that particular office shall be declared elected. These shall then be installed and shall hold office for one year or until their successors are duly elected.

ARTICLE II. Officers may be re-elected, but with the exception of the Secretary shall not hold the same office for more than two consecutive years.

ARTICLE III. The Council of the Association shall fill any vacancies that may occur among the officers.

SECTION V.

DUTIES OF OFFICERS.

Chairman and Vice-Chairman.

ARTICLE I. It shall be the duty of the Chairman to represent the Section in the Council of the Association, to preside at the annual meetings of the Section, appoint all committees of the Section and fill any vacancies when occurring in these committees. He may present an annual address on any subject of interest to the Section that he may deem of sufficient importance.

ARTICLE II. In the absence of the Chairman the First Vice-Chairman shall preside and exercise all the functions of the Chairman.

ARTICLE III. In the absence of the Chairman and the First Vice-Chairman the Second Vice-Chairman shall preside and exercise all the functions of the Chairman.

ARTICLE IV. In the absence of all three of these officers the Section shall elect a temporary Chairman.

Secretary.

ARTICLE V. The Secretary shall keep a record of the proceedings of the Section, shall send to the members such notice as the business of the Section may require, shall transmit to the General Secretary the names of the officers and committees elected or appointed, and notify the General Secretary of any changes in the personnel of the officers or committees of the Section, and shall furnish the General Secretary a report of the sessions held at the annual meeting. The Secretary, at least two months in advance, shall write to each member of the Section, giving notice of the latest date upon which papers can be accepted for the program.

ARTICLE VI. The Secretary shall be custodian of the records and documents of the Section, as well as of all funds, and shall make all disbursements subject to the approval of the Chairman.

ARTICLE VII. The Secretary shall arrange the program for the annual meeting, and furnish the editor of the JOURNAL of the Association the program for inclusion in the number just preceding the annual meeting.

ARTICLE VIII. The Secretary shall at each annual meeting present a brief report to the Association of the condition within the Section.

ARTICLE IX. In case the Secretary is unable to attend the annual meeting he shall notify the Council to that effect and the Council shall then appoint a temporary Secretary.

SECTION VI.

MEETINGS.

ARTICLE I. At least three sessions of the Section shall be held at each annual meeting of the Association. Additional sessions may be held at any time during the meeting when the officers of the Section may see fit, and by consent of the Council; provided, however, that these sessions be so arranged that

they conflict as little as possible with sessions of other Sections, and that no session be held simultaneously with the final session of the Association.

ARTICLE II. Provided, however, that these sessions be so arranged that they conflict as little as possible with sessions of other Sections, and that no session be held simultaneously with the final session of the Association.

SECTION VII.

ORDER OF BUSINESS.

ARTICLE I. The order of business at the first session shall be as follows: (1) Chairman's Address; (2) Secretary's Report; (3) Report of Standing Committees and Committees of the Association which report to this Section; (4) Nomination of Officers; (5) Miscellaneous Business; (6) Reading of Papers.

ARTICLE II. The time of the other sessions shall be taken up with the reading of papers, excepting as provided for in Section IV (Election of Officers) and Section X (Amendments) or to hear the reports of special committees.

ARTICLE III. Provided, however, that discussion of papers may be interrupted at any time to consider matters referred to the Section by the Association in general session or by the Council.

ARTICLE IV. This regular order of business may be suspended at any time during a session, for that particular session, by a three-fourths vote of those present.

SECTION VIII.

EXPENSES.

ARTICLE I. The expense of printing, postage and stationery shall be paid from the Association treasury, but in no case to exceed \$25.00 for the one year.

ARTICLE II. Appropriations for expenses other than those named here must be procured by authority of Council through the Chairman of the Section.

SECTION IX.

PAPERS.

ARTICLE I. Original papers on any subject of scientific interest may be accepted at the discretion of the officers of the Section.

ARTICLE II. The complete title and a brief extract of all papers, not to exceed 250 words, must be in the hands of the Secretary in time for inclusion in the program which is published, as provided in Section V, Article 7.

ARTICLE III. Fifteen minutes shall be allowed for the reading of a paper. If the paper is too lengthy to be read in detail within this space of time, it shall be presented in abstract.

ARTICLE IV. Each speaker in the discussion of a paper shall be allowed five minutes, but all such discussion shall be confined to the paper or subject under consideration at that time.

ARTICLE V. The time allowed for presenting a paper or discussion may be extended by unanimous consent of those present.

ARTICLE VI. All papers and reports presented to the Section become the property of the Association and shall be forwarded to the editor of the JOURNAL immediately following the annual meeting by the Secretary of the Section.

SECTION X.

AMENDMENTS.

ARTICLE I. These by-laws may be amended at the final session of any annual meeting by a two-third vote of those present, provided notice of such amendment is given together with the text thereof at any previous session held at that meeting. Amendments must finally be accepted by the Council as not in conflict with the Constitution and By-Laws of the Association.

SECTION XI.

MISCELLANEOUS.

ARTICLE I. Questions not specifically covered by these By-Laws shall always be decided in accord with the Constitution and By-Laws of the Association.

GENERAL RULES OF FINANCE

Adopted 1883

Amended 1885, 1887, 1888, 1895, 1900, 1901, 1903, 1909, 1910, 1912, 1913

First. The Treasurer shall deposit all moneys received by him, except those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee, and approved by the Council.

Second. Said moneys shall be deposited in the name of the American Pharmaceutical Association, and shall be paid out by numbered checks drawn by the Treasurer, on written warrant signed by the General Secretary.

Third. The correctness of every bill shall be certified to by the person contracting the same. If approved by the General Secretary, he shall endorse thereon his approval and the appropriation against which the same is to be charged. A warrant shall then be drawn and signed by the General Secretary, upon receipt of which, together with the original bills and their vouchers, the Treasurer shall draw a check for the amount.

Fourth. The Treasurer shall make a deposit in the bank whenever the money in his hands shall amount to fifty dollars.

Fifth. The Treasurer shall be the custodian of the bonds and saving-bank books, representing the several Funds belonging to the Association; and bonds and bank-books shall be in the name of the Treasurer, and the accounts of the same shall be kept by him.

Sixth. There shall be annually appointed by the Council an Auditing Committee, this Committee to consist of three members residing in or near the same city or town, as that in which the Treasurer resides, the Chairman to be named by the Chairman of the Council.

Seventh. The Treasurer shall balance his books January 1st of each year, and shall make out, previous to the fifteenth day of January following, his annual report for the financial year just closed.

Eighth. The Treasurer and General Secretary having thus balanced their books and made out their reports, shall place all such books, accounts, vouchers, etc., with the report, at the disposal of the Chairman of the Auditing Committee, at such time and place in January of each year as said Chairman may direct.

The Treasurer, in the presence of another member of the Association, shall make a list of the numbers and amounts of the bonds belonging to the Association, and both shall make affidavit to such list, which shall then be forwarded to the Auditing Committee for their use in auditing the books of the officers of the Association.

Ninth. Said books, accounts, vouchers, saving-bank books and accounts of the same shall be returned to the Treasurer and General Secretary within two weeks of the date of their reception by the Chairman of the Auditing Committee.

Tenth. There shall be a meeting of the Auditing Committee in January of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., etc., received by them; and previous to the 1st day of February following, to make a report thereon, in writing, to the Chairman of the Council.

Eleventh. The expense of the bonds of the Treasurer and General Secretary, given by a Trust Company, shall be paid for from the Treasury.

Twelfth. The Treasurer shall furnish with his annual report an alphabetical list of the names of the members from whom he has received money for dues and certificates during the financial year, for publication in the Proceedings.

Thirteenth. All balances remaining from appropriations at the close of each fiscal year shall be turned back into the treasury, unless otherwise ordered by the Council.

Fourteenth. The Chairman of the Council is instructed to appoint three members of the Association who, together with the Treasurer, shall be known as the Committee on Invested, Savings and Trust Funds.

Of the three members first appointed, one shall be appointed for one year, one for two years and one for three years. Each year thereafter, one member shall be appointed for three years. Members of the committee need not be members of the Council.

It shall be the duty of the said committee to carefully consider the nature and status of all invested, savings and trust funds of the Association, and to make an annual written report upon the same to the Council, which report shall be read (in full) at one of the general sessions of the annual convention of the Association, and published in full in the annual volume of Proceedings thereof.

The present custody of the funds shall not be affected by the adoption of these resolutions, neither shall the committee have the power to invest or re-invest any of such funds, except as instructed by the Council or Association.

GENERAL RULES OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

At the forty-seventh annual meeting of the American Pharmaceutical Association, held at Put-in-Bay, O., September 4-12, 1899, the Council resolved that no advertisements be solicited or accepted for any of the publications or programs issued by or in the name of the Association, and the General Secretary was instructed to inform annually the Local Secretary and Pharmaceutical Press of the resolution.

At the annual meeting of 1907, held in New York City, it was ordered that the three-year term of members of the Council elected by local branches of the A. Ph. A. shall date from the last annual meeting of the Association held previous to the date of election of the new Council member by a local branch. (See Proc. 1907, p. 25.)

At the fifty-seventh annual meeting, held at Los Angeles, Cal., August, 1909, it was ordered that space be annually set aside in the Proceedings for abstracts of the proceedings of the meetings of the National Association of Boards of Pharmacy and the American Conference of Pharmaceutical Faculties.

It was further ordered that the salary year of the officers of the A. Ph. A. be changed so as to run from July of one year to July of the next year, instead of, as heretofore, from September to September. (See Proc. 1909, p. 452.)

It was also ordered that the names of life members, new style, be designated in the Roll and List of Members by means of heavy or black-faced type. (See Proc. 1909, p. 459.)

At the fifty-eighth annual meeting it was ordered that the Committee on Membership submit all names of applicants for membership to the respective State representative on the committee for approval before sending the application to the secretary of membership for submission to the vote of Council, or if they be sent direct to the secretary of the Committee on Membership they shall be sent by him, first to the State representative, for approval. The Secretary of the Council shall have discretionary power in the application of this rule.

It was further ordered that the resignation of a member may be accepted during the first six months of the fiscal year for which his annual dues are payable.

THE FUNDS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

At the San Francisco meeting in 1889, the Permanent Secretary was directed to publish annually, in the Proceedings, a brief history of the origin, money value, and use to which each Fund may be applied.

There are seven permanent Funds at the present time, three of which are invested in Massachusetts State bonds, in the name of the Treasurer of the American Pharmaceutical Association.

THE LIFE MEMBERSHIP FUND.

The Constitution, as originally adopted in 1852, and up to the year 1856, contained no provision for life membership or for the creation of a permanent fund. In the year named a revised Constitution was reported by a committee, and, after consideration, adopted (see Proceedings 1856, pp. 12, 14, 27 and 79). Article II, Section 7 (afterwards Section 8), containing the following provision:

"Members who have paid their annual contribution for ten successive years shall be considered life members, and exempt from their yearly payments, and entitled to a certificate to that effect."

Owing to increased expenditures for the publication of the Proceedings, etc., the Association found it necessary in 1867 (Proceedings, p. 75) to increase its revenue, one of the measures being the erasing of Section 8, and the total abandonment of life membership in the future.

In 1870 a revised Constitution was adopted (see Proceedings 1870, pp. 87-96), and this, with a few slight amendments adopted in 1896 and 1900, is in force at the present time, containing the following:

"Article IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, *the interest of which for any current year only may be used by the Association for its expenses.*"

Chapter VI, Article 5, of the By-Laws adopted the same year, reads as follows:

"Any member who shall pay to the Treasurer the sum of *seventy-five dollars at a time* shall become a life member, and shall be exempt from all future annual contributions."

This article was amended in 1888 and 1896 and again in 1906 and changed to Article IV, Chapter VIII. As now in force, it reads as follows:

"Any member of the Association who shall pay to the Treasurer the sum of \$100.00 during the first year of his connection therewith, and also any member not in arrears, who after ten years shall pay the sum of \$75.00, or after fifteen years the sum of \$50.00, or after twenty years the sum of \$40.00, or after twenty-five years the sum of \$25.00, and any member who may have paid annual dues for thirty-seven consecutive years, shall become a life member, and shall be exempt from all future annual contributions."

In the roll of members for the year 1872 (page 338) the name of the late Charles W. Badger, of Newark, N. J., appears for the first time as a life member, and the only one (until the time of his death in 1877) under this provision, which was subsequently modified (Proceedings 1879, page 799) so as to reduce the sum to be paid into the treasury by those who had been members for from five to twenty years. In the same year the published roll contained the names of two new life members. The article on life membership was further modified in 1888 (Proceedings, page 52), again in 1896 (Proceedings, page 17), and again in 1906 (Proceedings, page 100), so as to apply to those who have been members for over twenty years (see Chapter VIII, Article IV, of the By-Laws). Under this clause the life membership (new style) of the present roll is ninety-eight, as published in the Proceedings.

The Treasurer's report for 1880 (page 524) states the life membership fund to be \$75, for 1881 (p. 513) \$613, for 1882 (p. 608) \$685, for 1883 (p. 436) \$904.38, and for 1884 (p. 524) \$944.14. At the Milwaukee meeting, held in the same year, the Association directed (Proceedings, p. 525) that \$316 which amount had been in past years donated to the funds of the Association by various members, be withdrawn from the general fund and be added to the Life Membership Fund. At the Providence meeting in 1886 (Proceedings, p. 147) it was recommended by the Finance Committee, and approved by the Council and by the Association, that the sum of \$3,000 be transferred from the general fund to the Life Membership Fund. At the Cincinnati meeting in 1887 (Proceeding, p. 471) the Association ordered again a transfer to the same fund of \$4,000.

Since 1887 the annual reports of the Chairman of the Council give the number of each bond of the registered securities in which the Life Membership Fund is invested. By vote of the Association, the name of this fund was changed to the William Procter, Jr. Fund on September 15, 1902 (see Proceedings 1902, p. 214), but was changed back to its original name, Life Membership Fund, on September 5, 1906 (see Proceedings 1906, p. 100). The report of the Treasurer on the special funds of the Association, contained in the addendum to his annual report, shows that on January 1, 1913, the value of the Life Membership Fund was \$18,969.25 (face value of securities only given), *of which sum the interest for any current year only may be used by the Association for its expenses.*

THE EBERT PRIZE FUND.

At the Richmond meeting in 1873 (Proceedings, p. 58), Mr. Albert E. Ebert presented to the Association the sum of five hundred dollars, to be used in the following manner:

"The money to be properly invested by order of the Executive Committee, and the annual interest derived therefrom to be appropriated for *conferring a suitable prize* for the best essay or written contribution containing AN ORIGINAL INVESTIGATION OF A MEDICINAL SUBSTANCE, determining new properties, or containing other meritorious contributions to knowledge; or for IMPROVED METHODS of determining merit, for the preparation of chemical or pharmacal products; the prize to be awarded by a suitable committee within six months after the annual meeting at which the essays are presented for competition; *provided*, that in case no one of the essays offered is of sufficient merit to

justify the award, in the judgment of the Committee on Prize Essays, all may be rejected, and the sum added to that of the Fund."

The offer was accepted by the Association, and by a special vote (*Ibid.*, p. 70) the fund was ordered to be called the *Ebert Fund*, and the prize awarded from the proceeds to be known as the *Ebert Prize*.

The Ebert Prize was awarded for the year 1874 to Charles L. Mitchell; for 1877, to Fred. B. Power; for 1882, to John U. Lloyd; for 1886, to Emlen Painter; for 1887, to Edward Kremers; for 1888, to Jos. F. Geisler; for 1890, to Wm. T. Wenzell; for 1891, to John U. Lloyd; for 1897, to Albert B. Prescott and Jas. W. T. Knox; for 1898, to Virgil Coblentz; for 1899, to Henry Kraemer; for 1900, to Edward Kremers and Oswald Schreiner; for 1902, to J. O. Schlotterbeck and H. C. Watkins; for 1903, to Fred. B. Power; for 1905, to Dr. Ernst Schmidt, of Germany; for 1906, to J. O. Schlotterbeck and H. C. Watkins; for 1907, to Fred. B. Power and Frank Tutin; for 1908, to A. B. Stevens and L. E. Warren; for 1909, to Henry Kraemer; for 1910, to Harry M. Gordin; for 1911, to W. A. Puckner and L. E. Warren.

The Ebert Fund amounted in 1883 (Proceedings, p. 436) to \$683.43. Since 1887 the reports of the Chairman of the Council specify the securities in which this fund is invested. On January 1, 1913, its reported value was \$1,023.56 (face value of securities only given). The *annual interest must be applied to a prize for an original investigation* meeting the requirements stated above.

In accordance with the recommendation of the committee on invested savings and trust funds, submitted and adopted at the fifty-eighth annual meeting, see Proceedings, 1910, p. 454, the name of the Ebert Fund was changed to Ebert Prize Fund, and the amount of the prize limited to \$25.00 until the excess of interest above the sum annually awarded and added to the principal shall amount to \$1,000.00, after which the entire annual interest upon the same shall constitute the Ebert Prize.

THE CENTENNIAL FUND.

After the meeting held in Philadelphia in 1876, the local committees, on settling all accounts for the entertainment of the Association, had an unexpended balance left, which by subsequent collections made in Philadelphia was increased to \$525. At the Toronto meeting in 1877 (Proceedings, p. 481), Dr. A. W. Miller, local secretary for 1876, presented this sum in the name of the local committees, to the Association, with this condition, "that a like amount be subscribed by the members within one year," with a view of establishing a fund *to aid in the prosecution of original investigations*, the interest accruing from the investment of the fund to be devoted to the defraying of expenses actually incurred by members in conducting investigations in some branch of science connected with pharmacy. The Association accepted the conditions (*Ibid.*, pp. 526-528), and adopted the name *Centennial Fund*.

The collection of a like amount by the Association was completed at the Saratoga meeting (Proceedings, 1880, p. 553), when \$582.81 had thus been received. In the following year a committee of the Centennial Fund was provided for in the By-Laws of the Council, Chapter VII (Proceedings, 1881, pp. 190, 549). Members have not availed themselves of this fund to the extent contemplated at its foundation; for the amounts paid out have been only \$7.50 to Robt. B. Warder for material used for investigations reported in 1885; \$96.80 used by the Committee on National Formulary during the years 1886 and 1887 (Proceedings, 1889, page 16); and \$32 to Edward Kremers

for material necessary for the prosecution of scientific research on the menthol group, reported in the Proceedings for 1892; \$50 to the same investigator in 1893, and \$50 again to the same investigator in 1894. In 1896 the sum of \$22.33 was paid to the Committee on Indicators for material used in their investigations.

The original sum of \$1107.81 (\$525 + \$582.81) had increased in 1883 to \$1232.76. Since 1887 the securities in which the fund is invested are specified in the reports of the Chairman of the Council; the reported value was \$2639.13 (face value of securities only given) on January 1, 1913. *The interest accruing from this Fund is to be used for defraying the expenses incurred in conducting original investigations in pharmacy or an allied science.*

THE ENDOWMENT FUND.

At the fifty-fourth annual meeting, held at Indianapolis, Ind., September, 1906, Messrs. Samuel A. D. Sheppard and James H. Beal proposed the establishment of a permanent fund to be known as the "Endowment Fund" (see Proceedings 1906, p. 99), under the following conditions:

"That the said S. A. D. Sheppard and J. H. Beal jointly agree to pay into said fund one dollar for each twenty dollars contributed and paid into said fund by all other members of this Association up to and until such Endowment Fund shall, with its accumulations of interest, reach the sum of twenty-five thousand (\$25,000) dollars.

"That as moneys shall be received as additions to said fund the same shall be invested in such securities as the Council may direct until the interest and other accumulations, together with the amount of the principal, shall reach the sum of twenty-five thousand (\$25,000) dollars.

"That when the Endowment Fund shall have reached the sum of twenty-five thousand (\$25,000) dollars one-half the income derived therefrom may be used for any purpose deemed wise by the Association.

"That when said Endowment Fund, inclusive of donations, interest and other accumulations, shall amount to the sum of fifty thousand (\$50,000) dollars, the Association may use ninety per cent. of the income therefrom for any purpose deemed wise by the Association.

"That under no circumstances whatever shall all the income from said fund be used, but at least ten per cent. thereof shall be annually added to the principal of the Endowment Fund.

"That under no circumstances whatever shall the principal or any part thereof be used for any purpose except investment for income, nor pledged for any debt or obligation of the Association, or any person, nor used for any other purpose or in any other manner than as specified."

Contributions to the Endowment Fund have been made at different times, and the names of the contributors published in the annual volume of Proceedings (see Proc. 1907, pp. 47 and 48; Proc. 1908, pp. 476 and 477; Proc. 1909, p. 464; Proc. 1910, p. 478); according to the Treasurer's report, the total amount contributed and accumulations up to January 1, 1913, was \$5,601.79.

THE GENERAL FUND.

On February 26, 1909, the Council directed that \$5,000.00 of the current funds of the Association be invested by the Treasurer in some interest-bearing security, to be approved by the Finance Committee and the Chairman of the Council (see Proc. 1909, p. 449). In accordance with this order the Treas-

urer reported on May 26, 1909, having purchased five \$1,000.00 St. Louis, Mo., 4 per cent. bonds at 103 $\frac{5}{8}$ and accrued interest. Again, on November 15, 1909, the treasurer, in accordance with an order of the Council (see motion No. 11, page 449) invested \$5,000.00 of the current funds of the Association in St. Louis city public buildings and public works 4 per cent. gold bonds. All of these bonds are registered in the name of the treasurer of the A. Ph. A. and are kept in the Association's safe-deposit box.

THE WM. PROCTER, JR., MONUMENT FUND.

At the fifty-second annual meeting held at Kansas City, Mo., September, 1904, it was resolved to solicit subscriptions for a memorial monument to be erected in the Smithsonian Grounds at Washington, D. C., to the memory of William Procter, Jr., if possible in 1817, the centennial anniversary of his birth. A committee was appointed to take the matter in charge, which since that time has been active in soliciting subscriptions. The names of contributors have been published from time to time in the annual volume of Proceedings (see Proc. 1906, p. 63; Proc. 1907, p. 98).

In September, 1907, at the annual meeting held in New York City, the Association directed that all moneys collected for the William Procter, Jr., Monument Fund be turned over to the Treasurer of the A. Ph. A., to be deposited on interest for the benefit of said fund (see Proc. 1907, p. 99). The Treasurer of the A. Ph. A., in his annual report for 1908-1909, reports having received on January 27, 1909, the sum of \$3,413.33 from the Treasurer of the Committee, Benj. T. Fairchild, which was placed on time deposit in the International Bank of St. Louis, Mo., for a period of twelve months at 4 per cent. per annum (see Proc. 1909, p. 472). The total sum to the credit of this fund, including interest on time deposits, according to the treasurer's report on January 1, 1913, amounted to \$4,855.48.

THE EBERT LEGACY FUND.

The late Albert E. Ebert having by his will designated the A. Ph. A. as residuary legatee of his estate, it was ordered at the fifty-eighth annual meeting, on recommendation of the committee on invested savings and trust funds, that the money received from the estate be converted into a fund to be known as the Ebert Legacy Fund, and that this fund be invested in municipal or other public bonds approved by the committee on invested savings and trust funds and the finance committee, and that this fund be kept intact and the income added thereto until the fund and its accumulations shall together amount to a total of \$10,000.00.

When this sum has been reached, the income derived from the fund shall be devoted to such purposes as will, in the opinion of the Council, best commemorate the founder of the fund and his services to pharmacy.

The reason for the suggestion that the old Ebert Fund and the Ebert Legacy Fund be kept separate was, that the first was given by Mr. Ebert for a specific purpose, while the latter was given to the Association practically without restriction and with the evident intention that the Association should use it in the manner which it deemed best.

On December 14, 1909, the executors of the Ebert estate paid over to the Treasurer of the A. Ph. A. the sum of \$2,800.00, which has been deposited in bank at interest. The Treasurer's report states that January 1, 1913, this fund amounted to \$3,166.14.

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REPORT

ON THE

PROGRESS OF PHARMACY

1912

By C. LEWIS DIEHL

REPORTER ON THE PROGRESS OF PHARMACY

WITH THE COLLABORATION OF

HARRY V. ARNY

OTTO RAUBENHEIMER

LINWOOD A. BROWN

CLYDE M. SNOW

ERNEST C. MARSHALL

MARTIN I. WILBERT

INTRODUCTORY

THE practically unanimous action of the Council at the Nashville meeting of the Association (1913), which was confirmed without a dissenting vote at the last general session, whereby the action taken at the Denver Meeting (1912) was rescinded, should, as is doubtless intended, permanently secure the publication of the Report on the Progress of Pharmacy in conformity with the original plan adopted at Boston in 1911, as a separate and distinct annual volume, including also a list of Officers, Committees and Members, and the Constitution and By-Laws of the Association, for which the title

"Year-Book of the American Pharmaceutical Association" was recommended by the Committee on Publication.

It is perhaps superfluous to say that your Reporter regards this reconsideration and action of the Association to be exceedingly felicitous; not so much, however, because he has by its consummation reached the goal of his ambition—dormant for many years—of a Report on the Progress of Pharmacy published in the form of a concrete and quasi-independent volume, but, more largely, because of his conviction that in the proposed form it will prove of inestimable value to the average practicing pharmacist as a work of daily reference: a work that will doubtless improve from year to year under the direction and guidance of younger and probably more progressive leadership than at present.

Doubtless some such thought actuated the Council at the Richmond Meeting (1910) to suggest that the Reporter consider the

feasibility of assistance by a number of collaborators, who would be willing to lighten his work by making abstracts of papers on certain topics or from certain journals to be assigned them; but, entirely unprepared for this suggestion, it could not be acted upon at once, and the report for 1911 was therefore made by the Reporter without such assistance. In the meantime, however, partly by voluntary offer and partly by solicitation, the members mentioned as collaborators consented to give this assistance and accepted the assignments of certain journals with the understanding that they make abstracts *from original papers only* appearing in the journals assigned to them, namely:

Prof. Harry V. Arny, from the *Schweizer Wochenschrift für Chemie und Pharmazie* and from the *Archiv der Pharmazie*;

Mr. Linwood A. Brown, from the publications of the American Chemical Society;

Mr. Ernest C. Marshall, from the Proceedings of the State Pharmaceutical Associations;

Mr. Otto Raubenheimer, from the *Apotheker Zeitung* and from the *Pharmaceutische Zentralhalle*;

Prof. Clyde M. Snow, from a certain number of the American Journals; and

Mr. M. I. Wilbert, from the publications of the American Medical Association.

These gentlemen, to whom the thanks of the Association are due for the gratuitous service rendered, place the Reporter under additional obligation by their prompt and courteous response in supplying the required abstracts covering their respective assignments for the year 1912 and amounting to a total of nearly four hundred subjects. These are included in the present report with only a few minor changes in the headings, and are identified by the initials of the names of their contributors, appended to the respective abstracts.

It is believed that with the assistance thus rendered by the collaborators the present report will fairly represent the progress made during the year 1912,¹ with the further advantage of intro-

¹*Note.*—This statement, in so far as it applies to the American Journals, is not literally correct. A certain number of these journals had been assigned to Professor Snow, who reported promptly. The remainder had been assigned to a member who was prevented (for reasons since explained) from making any report whatever and failed to notify the Reporter so that a new assignment might be made. Unfortunately, this omission includes some of the journals in which many original articles appear, and it will therefore be necessary to re-assign them for the report of 1913.

ducing topics that have heretofore been omitted by the Reporter, but have appealed to the collaborators according to their individual trend; and this, under proper limitations, will doubtless make the "Year Book" more desirable to the average pharmacist and promises well for the future.

Respectfully submitted,
C. LEWIS DIEHL,
Reporter on the Progress of Pharmacy.

PHARMACY

A—GENERAL SUBJECTS

U. S. P. as a Standard.—Kebler, L. F., in discussing the desirability of restricting the number of drugs used, points out that the Pharmacopœia is the law and standard, but that with the present construction of the law, he is inclined to wish that there was no Pharmacopœia.—J. Am. M. Assoc., 1912, v. 59, p. 1165. (M. I. W.)

"U. S. P. and N. F. Propaganda."—An editorial (J. Am. M. Assoc., 1912, v. 58, p. 640), in commenting on the various efforts to supplement the "Propaganda for reform in proprietary medicines," points out that the "U. S. P. and N. F. Propaganda" of the pharmacists falls short of the ideal in that it merely aims to substitute a ready-made, usually complex and unscientific mixture of known composition, for a ready-made, equally complex and unscientific mixture of unknown composition and may mean that the physicians who previously used certain proprietaries uncritically will be led to use just as uncritically the preparations from which the proprietary was derived. (M. I. W.)

German Pharmacopœia—Comments.—Dr. A. Schneider and R. Richter have presented a very valuable contribution to pharmaceutical literature in their comments on the fifth edition of the German Pharmacopœia, which were published in installments in the *Pharmazeutische Centralhalle* during 1912. These comments have also been published as reprints, which are printed on one side of the paper only, and which can be used as a supplement to the *Handkommentar* and Schneider and Süss. (O. R.)

Pharmacopœia Austriaca VIII—Comments.—The following comments are submitted by the scientific laboratory of G. Hell & Co.:

Aluminum Aceticum Solutum (Lig. Alumin Subacet.)—A comparison is made between the preparation of the seventh and eighth

edition and the conclusion is reached that the specific gravity should be 1.0375 instead of 1.046.

Chininum Tannicum.—The solubility statement in 800 parts of cold water and in 30 parts of hot water is questioned.

Extractum Belladonnæ Foliorum.—The prescribed alkaloidal content 2 per cent. is too high, as belladonna leaves containing 0.03 per cent. alkaloid yield an extract with an alkaloidal content of 1.6 per cent.

Extractum Chinæ frig. parat. siccum.—The alkaloid content of this dry extract of cinchona, prepared by cold percolation, is about 20 per cent. and *not* 7.5 per cent.

Extractum Dulcamaræ Siccum. While all other dry extracts are diluted with acacia so that 2 parts of the dry extract represent 1 part of pilular extract, Ph. Aust. viii orders equal parts to be evaporated to dryness with the result that 1.7 parts of the dry extract represents 1 part of the pilular extract.

Extractum Hamamelidis fluidum.—The required dry residue of 23 per cent. is too high and 17-20 per cent. is more correct, especially as the leaves should yield 20 per cent. of extract. For the determination of the extract of this and other drugs it would be well to use alcohol of the same strength as employed in the preparation of the respective galenicals.

Extractum Liquiritiæ.—All other aqueous extracts are purified by precipitating the albuminous and mucilaginous substances with alcohol, and this should also be done in this extract.

Extractum Strychni.—Extract of *nux vomica* is ordered to be prepared with diluted alcohol (68%) according to the general process given under extract of belladonna leaves, which, however, also dissolves the 4 per cent. of fat in *nux vomica*. After distilling off the alcohol this objectionable fat remains in the aqueous extract and causes same to deteriorate. This fat can be removed partly by means of paraffin or completely by extraction with petroleum ether. The alkaloid content of extract of *nux vomica* might be increased from 16 to 18 per cent.

Solutions of Narcotic Extracts.—Solutions of 10 parts of narcotic extract, 6 parts of water, 3 parts of glycerin and 1 part of alcohol, may be kept ready for dispensing. But this menstruum is unsuitable for extract of squill and Indian Cannabis.

Detection of Copper, Tin, Lead, etc., in the Ash of Extracts.—The Austrian Pharmacopœia orders these metals to be detected by the addition of H_2S water or T. S. to the HCl solution of the ash. But in the presence of iron oxide in the ash, as f. i., in Extract

of Iron Malato, the H_2S water, especially when not fresh, will be oxidized and sulphur will be precipitated. In this case, as well as in general, it is best to use freshly generated H_2S gas.

Extractum and Tinctura Malatis Ferri.—Several analysts have reported that when the calcined ash is treated with nitric acid or a nitrate in order to completely oxidize the carbon, ferrous oxide or iron, and is then dissolved in HCl , free chlorine will be evolved; but they have failed to give an explanation except that this is due to a trace of nitric acid left in the ash. As it has been found in the laboratory of Hell & Co. that free chlorine will also be evolved even when no oxidizing agent is employed, the cause of this was traced to the manganese content of the iron, as apples are free from it. By the calcination of the ash MnO is oxidized to Mn_2O_3 , which acts the same as MnO_2 , reducing HCl to free Cl even at a temperature of 60°C . It is recommended to heat the HCl solution of the ash, so as to drive off the free Cl , and then determine the iron content iodometrically. By taking this precaution uniform results are obtained.

Ferr. hydrooxydat. dialysat. solut.—It is shown that a great many dialyzed iron preparations in the market contain less than 3.5 per cent. of Fe and more than 0.239 per cent. of HCl or 0.378 per cent. of FeCl_3 , as required by Pharm. Austr.

Hydrarg. Chloratum mite.—When testing for HgCl_2 in calomel it is essential to use filter paper which is entirely free from Cl . It is recommended that such filter paper should be specified and should be included among the list of reagents, etc.

Natrium Chloratum.—The flame test for potassium in sodium chloride is unreliable, quite especially as a great deal of blue glass is not suitable and gives fallacious results. The authors recommend Koevenagel's reagent of Cobalt-sodium-hexanitrite, which produces a yellow precipitate in potassium solutions even as dilute as 1:2000. If 1 per cent. KCl is permissible in the official NaCl , then no precipitate will be produced in a 5 per cent. solution of sodium chloride.

Tincturæ.—The percentage of dry residue serves as the valuation of a great many tinctures, but is expressed as "*for the menstruum*" and *not* as in the *finished tincture*. That, therefore, the figures are too high can be seen in Tincture Benzoes, which should contain 18 per cent. of dry residue. Benzoin should contain 90 per cent. of alcohol soluble resin. The tincture is prepared by macerating 20 parts=18 parts soluble resin, with 100 parts of alcohol. As 118 parts of the finished tincture contain 18 parts of dry residue, therefore the percentage is only 15.25 and not 18.

Tinctura Strophanti.—The seventh edition ordered the seed to be deoleated with ether, which, on account of also dissolving some strophantin, was changed to petroleum ether. The tincture was prepared with 90 per cent. alcohol. The eighth edition orders the bruised seed to be percolated with diluted (68%) alcohol into a 10 per cent. tincture. This preparation is unsatisfactory, as oil drops separate, gets turbid in cold weather and does not mix clear with water. The authors recommend that the drug should be standardized and that the tincture should be prepared from deoleated seed. (Such a tincture is also better tolerated by a weak stomach, not causing nausea.—O. R.)—Ph. Post, 1912, No. 4, 37-41. (O. R.)

Pharmacopœia Belgica—Additions.—The Commission has circulated the tentative monographs of the proposed additions to the Belgian Pharmacopœia among the pharmaceutical journals and societies. New remedies: Aspirin, veronal, picric acid, ammonium bromide, coca leaves, pyramidon, urotropin, methylene blue, dionin, heroin hydrochloride, benzonaphthol, atoxyl, arrhenal, oxygen, novocain, phenolphthalein, sparteine sulphate and tannigen. Galenicals: Aluminum acético-tartaricum solutum, with the synonym Liqueur de Burrow, to replace solution of aluminum acetate, fluidextract coca with 0.5% alkaloids, fluidextract (?-O. R.) jodotannic, syrup jodotannic, zinc oxide pasta and salicylated zinc oxide paste. Changes: The hydrastin content of the fluidextract is to be 2 per cent., and an assay for theobromine will be added to the monograph on diuretin.—Ph. Ztg., 1912, No. 75, 754. (O. R.)

Brussels Conference.—A reply to a query calls renewed attention to the Brussels Conference and the international treaty on uniformity of pharmacopœial formulæ for potent medicaments and points out that in practically all of the countries of Europe where the National Pharmacopœias have been revised, the provisions of the treaty have been closely adhered to. The total number of compliances with article 1 of the original protocol has been increased from 129 in 1902 to 260 in 1910, while the non-compliances have been reduced from 131 in 1902 to 15 in 1910; the present U. S. P. being responsible for no less than 5 of the latter.—J. Am. Med. Assoc., 1912, v. 59, p. 2175. (M. I. W.)

Congress of Pharmacists of Poland.—The first congress of Polish Pharmacists was successfully held at Lodz on May 25 and 26, 1912. A great many papers were read and twenty resolutions were adopted, which have to be consulted in the original report.—Ph. Post, 1912, No. 48, 509. (O. R.)

Pharmacist, Status of.—Kraemer, Henry, presents some thoughts on the position of the retail pharmacist as a purveyor of pure drugs. He points out the great increase during the past 25 years in the number of drugs that are being used or offered for sale, discusses some of the factors in the improvement of drugs and points out the need for coöperation between pharmacists and physicians in the work of eliminating inert and otherwise objectionable medicaments from the materia medica.—J. Am. M. Assoc., 1912, v. 59, pp. 1599-1603. (M. I. W.)

Certified Pharmacies.—An editorial (J. Am. M. Assoc., 1912, v. 59, p. 461), discusses the practicability of establishing a standard for certified pharmacies, and points out that while the requirements for such certifications should be carefully considered, the need of a dividing line between the druggist, whose energies are chiefly devoted to the sale of cigars, chewing gum, soda-water, and patent medicines, and the pharmacist, to whom one may safely entrust the compounding of prescriptions, is so urgent that the medical practitioner will look forward to the outcome with much interest. (M. I. W.)

Pharmaceutical Museum.—In the museum of natural history in Magdeburg, Germany, two rooms have been opened on September 15, 1912, containing pharmaceutical collections, namely, one of drugs which have been used in pharmacy during the past fifty years, while the second contains a very large and interesting collection of utensils, apparatus and receptacles, such as jars and bottles. Apotheker E. Bodenstein donated most of the collection.—Ph. Ztg., 1912, No. 75, 756. (O. R.)

Official Preparations—Shall the druggist make or buy them?—Writing upon this subject, Mr. James H. Martin, of Winchester, Ky., divides the preparations for which formulas are given in the pharmacopœia into thirty-one classes, all of which he asserts can be made to advantage by the druggists, with the exception of Extracts, Fluidextracts, Tinctures of potent drugs and some few of the liquors.—Proc. Kentucky Phar. Assoc., 1912, pp. 119-122. (E. C. M.)

B—APPARATUS AND MANIPULATION

Weights and Measures Should be Guaranteed U. S. P. Standard.—Joseph W. England says that "there is probably no more important need in the pharmaceutical world than the necessity of having accurate and uniform weights and measures, especially measures of volume. It is simply idle to standardize the more potent remedies of the Pharmacopœia, with the greatest possible degree of accuracy,

and then measure them with measures that are not accurately graduated."

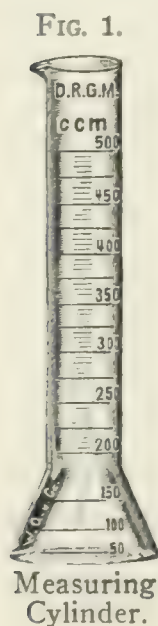
In a test of thirty-six eight-ounce graduates of different makers it was found that:

1. That not one of the measures were accurately graduated.
2. Some were better than others, but that all were bad.
3. On one graduate the six fl. ounce mark was correct only.
4. On twelve graduates the four drachm mark was the correct measure of six fluid drachms, a variation from the standard of 50 per cent.

The standard used in testing these graduates was one fluid ounce = 29.5161 grammes of water, weighed in dry air at a temperature of 15° C., barometric pressure of 760 mm., the coefficient of expansion of the glass being assumed to be 0.000025 and the density of the brass weights 8.3, these figures being derived from the original data in use at the National Bureau of Standards of the U. S. at Washington, D. C.

Graduates should be held in a perfectly level position when measuring, with careful observation of the lower meniscus. The narrow cylinder shaped graduates yield more accurate results than the cone-shaped graduates. The use of graduated prescription bottles should be discouraged because they vary greatly in accuracy. The American-made graduates, in accuracy and appearance, are superior to those of foreign make and are more likely to be in accord with U. S. P. standards.

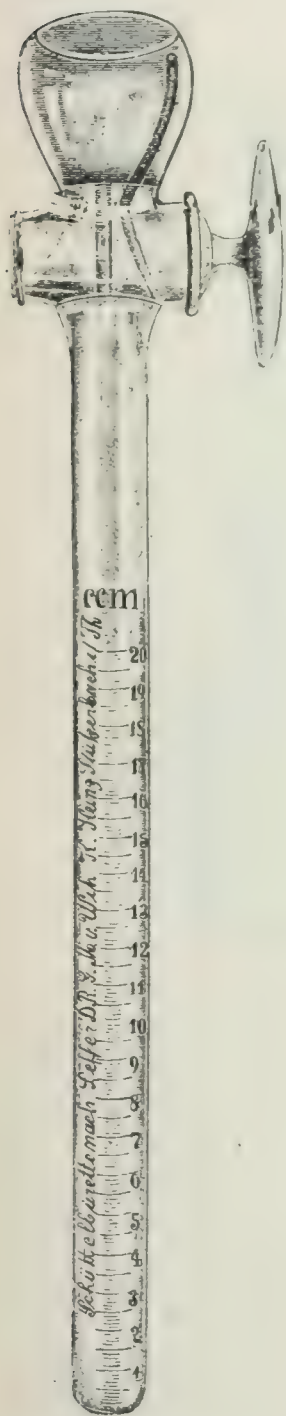
He recommends that all graduates should be required to be guaranteed by the manufacturers and should be marked "Guaranteed U. S. P. Standard by ———," and that pharmacists should purchase no goods not so marked, for use in pharmaceutical measurements of volume.—Proc. Penn. Phar. Assoc., 1912, pp. 118-120. (E. C. M.)



Measuring and Mixing Cylinder—A Practical Form Permitting Evaporation.—Warmbrunn, Quilitz & Co., Berlin, have introduced a new form of measuring and mixing cylinder which has the advantage of permitting reduction to the desired volume by evaporation of liquids without the necessity of removing them from the cylinder. This becomes possible by the expansion of the bottom of the cylinder, as shown in the accompanying drawing (Fig. 1), which affords an adequate heating surface.—Pharm. Ztg., lvii (1912), No. 49, 494.

An Extract Centrifuge Sediment Measure.—Dr. C. Strzyzowski describes a new sediment tube made by F. Hegershoff of Leipzig which is calibrated to 1/100 of a cubic centimeter and has metallic

FIG. 2.



Absorption Measure

cap at base to render it stronger.—Schweiz. Wschr. f. Chem. u. Pharm. 1. (1912), No. 33, 497. (H. V. A.)

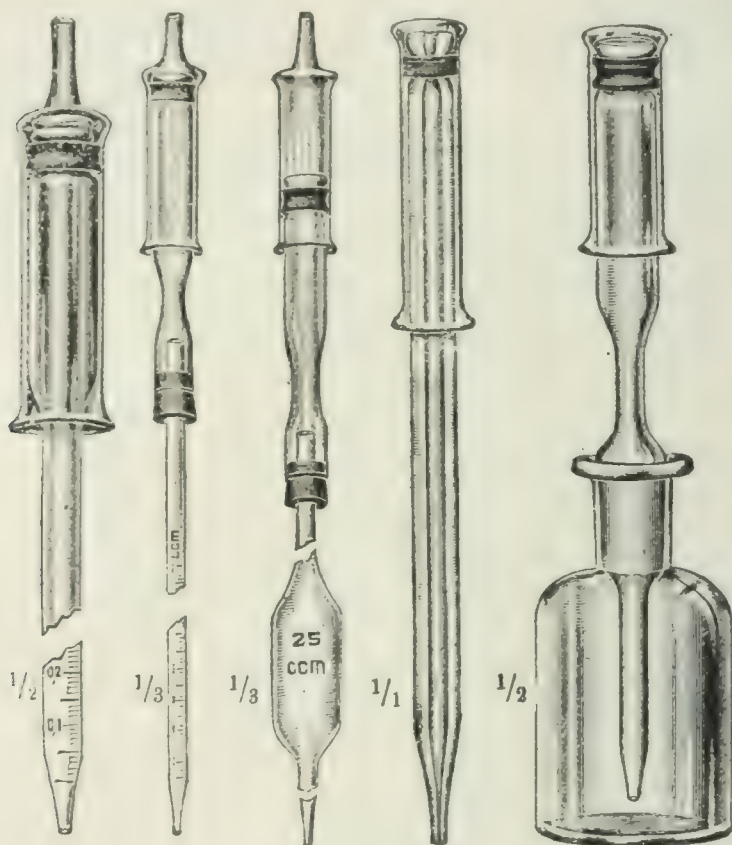
Graduated Absorption Measure—A Convenience for Determining the Absorbability of Different Liquids.—Wilh. K. Heinz (Stützenbach i. Th., Saxony), constructs and supplies the graduated measuring tube shown by Fig. 2, which permits the convenient determination of the absorbability of different immiscible liquids when shaken together. The little apparatus is surmounted with a cup which serves as a reservoir for the liquid to be measured. On opening the glass cock, which has two borings, the liquid enters the tube through one of them and escapes from the other, so that according to the turn given to the cock, the inflow of liquid may be regulated and reduced even to drop by drop. The apparatus has proven particularly serviceable for the determination of hydrocarbons in benzines and illuminating oils which are absorbed by concentrated sulphuric acids, rendering an operation, usually very troublesome, extremely convenient.—Pharm. Ztg. lvii (1912), No. 41, 413.

Pipettes—Glass Suction-Attachments.—Dr. Heinr. Göckel (Berlin, N. W.) supplies pipettes of various kinds and forms with glass suction-attachments, which, sliding air-tight (by means of rubber packing) on the stem, may be raised or lowered at will. The extremity of this attachment being open, and on a level with the orifice of the pipette, the orifice is closed with the finger, the point of the pipette introduced into the liquid, and the cap is raised upward, whereby the liquid is

drawn into the pipette to the desired height. On releasing the finger from the orific, the liquid is discharged with greater or less speed or quantity according to the manipulation exerted with the finger—

this operation being essentially the same as when ordinary pipettes are used. Various forms of pipettes are shown by the accompanying cut (Fig. 3), and clearly demonstrate the utility of the glass suction-attachment or cap.—Pharm. Ztg. lvii (1912), No. 94, 946; from Med. Klin., 1912, No. 42.

FIG. 3.

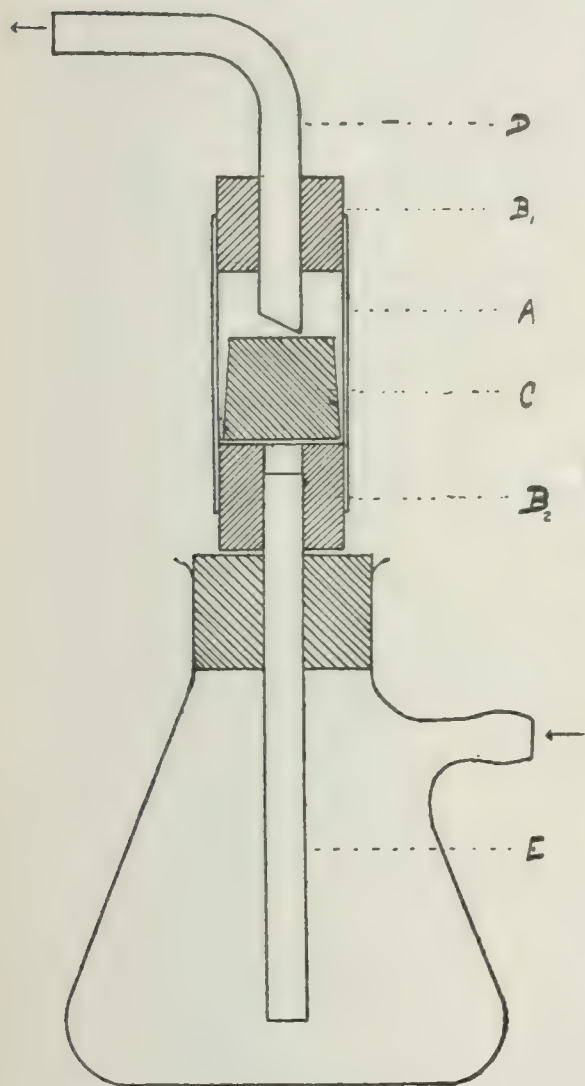


Pipettes.

Filter Pumps—A Simple Valve.—H. B. Hutchinson observes that where the water pressure is fairly constant, the introduction of a safety-flask between the pump and apparatus is sufficient for all practical purposes; but in cases where the pressure is liable to great variation, a safety-flask is of little use in preventing water from sucking back into the apparatus, and a reliable valve becomes a necessity. Such he finds in the simple valve shown by Fig. 4, which has proven very efficient. The valve consists of a stout glass tube (*A*), $\frac{1}{2}$ to $\frac{3}{4}$ inch in diameter, fitted with two single-bored rubber stoppers (*B*₁ and *B*₂), between which is placed a solid rubber bung (*C*), with its wider end downwards, and fitting loosely into the tube. A glass tube (*D*), with an oblique lower end, is pushed through *B*₁ until it is about $\frac{1}{2}$ mm. from the upper surface of the bung (*C*), and a second tube (*E*) is brought sufficiently far into

B_2 to act as a support without bulging the upper surface of the stopper. The valve thus made may be used alone, or it may be attached to a small filter-flask, provided with a lateral connection tube, as shown in the illustration. The latter way has the advantage of keeping stoppers moist, but when the apparatus is intended solely

FIG. 4.



Filter Pumps.

as an air valve, a little diluted glycerin fulfills this function. The tube D is attached to the pump, the tube E , or the side tube of the filter flask, is connected with the filtering or vacuum distillation apparatus. —Chem. News, Aug. 30, 1912, 99.

FIG. 5.



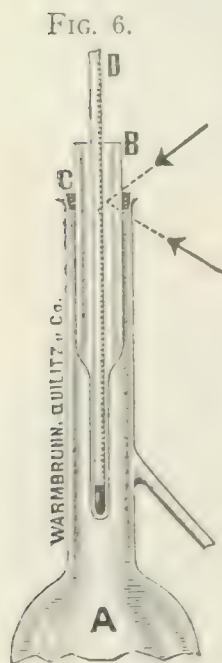
Funnel and Measure.

Combination Funnel and Measure—A Practical Utensil. —Otto Scharlach, Nürnberg, has introduced a funnel for measuring and filling benzin

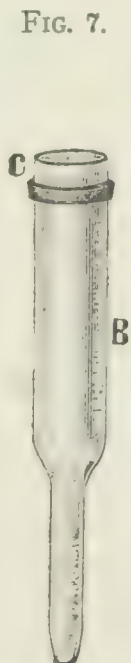
and other liquids, which is constructed of tinned iron in the shape shown by the accompanying drawing (Fig. 5.) It is provided with a flange at the top extending diagonally inward, towards the center, so that when the funnel is closed by a patented valve in the neck, it may be carried about and handled without spilling its contents. On the interior a graduated scale for measuring is provided, the capacity of the funnel being about 5 liters.—Pharm. Ztg. lvii (1912), No. 58, 583.

Solution and Evaporating Flask—A Convenient Form.—Professor Zenghalis has devised a flask adapted for conveniently dissolving substances and preventing loss by spirting during boiling. The flask has the general shape of the Erlenmeyer flask, and is provided with two long lateral holes which, when the mouth of the flask is covered, establish a strong draft by which the vapors formed are rapidly carried off. The cover consists of a watch-glass, bearing through a central hole a stirring rod freely suspended and thereby preventing the bumping of boiling liquids, so that the flask may be exposed without danger to the heat of the sand bath or upon an asbestos plate heated by direct flame. Evaporation in this flask is far more rapid if conducted in an open dish.—Pharm. Ztg. lvii (1912), No. 32, 322.

Thermometer Case.—Force. J. N., describes and illustrates an efficient home-made thermometer case. This case consists of an ignition tube of heavy glass 1 Cm. in diameter and 11 Cm. in length. The end of the thermometer is thrust into a soft-rubber cork, and a fountain-pen carrying clip slipped over the outside of the tube. For solution he uses 50 per cent. alcohol.—J. Am. M. Assoc., 1912, v. 59, p. 797. (M. I. W.)



Thermometer Holder.



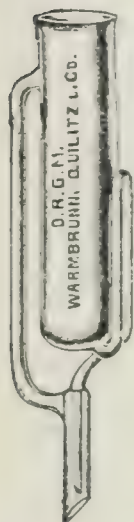
Thermometer Holder—Adaption to Distilling Flasks.—Freund has devised a practical form of thermometer holder for insertion into the neck of the distilling flask, which permits the insertion, removal or change of the thermometer as may be desirable during the process of distillation. The holder (B) in somewhat enlarged form is shown by Fig. 7, while Fig. 6 shows it in position with the thermometer inserted, its position being secured by means of a thin rubber band (C) as shown in both drawings. The holder has a diameter of only a few millimeters less than that of the neck of the flask, the constricted extension beneath maintaining the ther-

monometer (D) in a vertical position. The apparatus fitted with the new holder is supplied by Warmbrunn, Quilitz & Co., Berlin.—Pharm. Ztg. lvii (1912), No. 49, 493.

Soxhlet Apparatus—Improved Construction.—In the Soxhlets

hitherto in use the upper part of the apparatus has always been rigidly united to the outflow tube, under the impression that this imparted stability and prevented breakage. The contrary, however,

FIG. 8.



is the case. The firm of Warmbrunn, Quilitz & Co., Berlin, N. W., now supply the upper part separate, in the form shown by Fig. 8, which when attached to the lower part permits the expansion and contraction of the apparatus by changes in temperature without the risk of fracture.—Pharm. Ztg. lvii (1912), No. 7, 65.

Water Still—A Reliable Automatic Form.—Under the British Excise Law, pharmacists are permitted, without paying duty to use a still *exclusively for making distilled water*, provided its boiler capacity does not exceed one gallon.

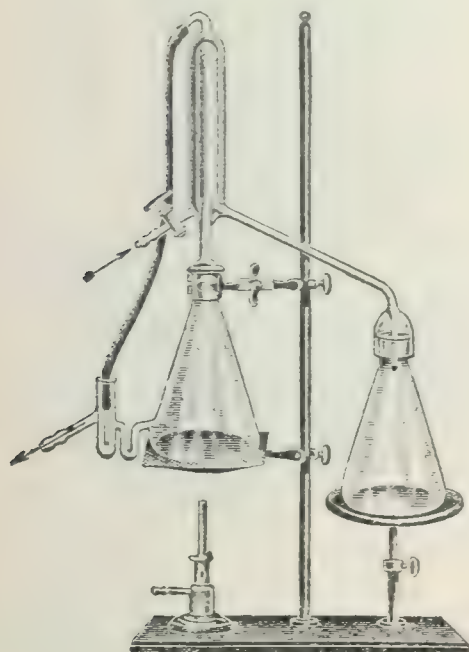
Soxhlet.

The still shown by Fig. 9, supplied by S. Maw, Son and Sons, fulfils this requirement. It is fed automatically and when in operation gives a steady flow of about 6 pints of distilled

water after the supply of gas and condensing water has been properly regulated, and, of course, at a nominal cost.—Pharm. Jour.

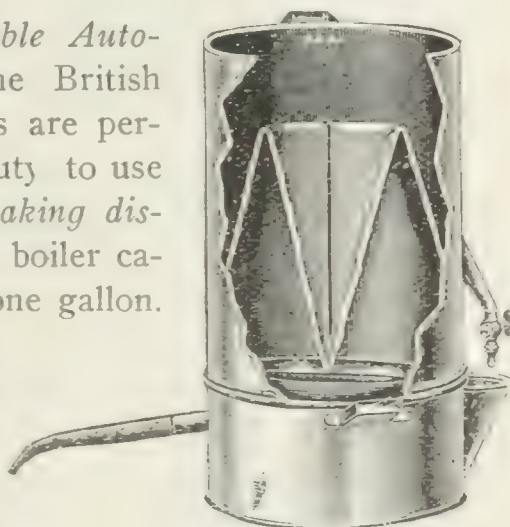
and Pharmacist, Jan. 20, 1912, 80.

FIG. 10.



Autodistillator.

FIG. 9.

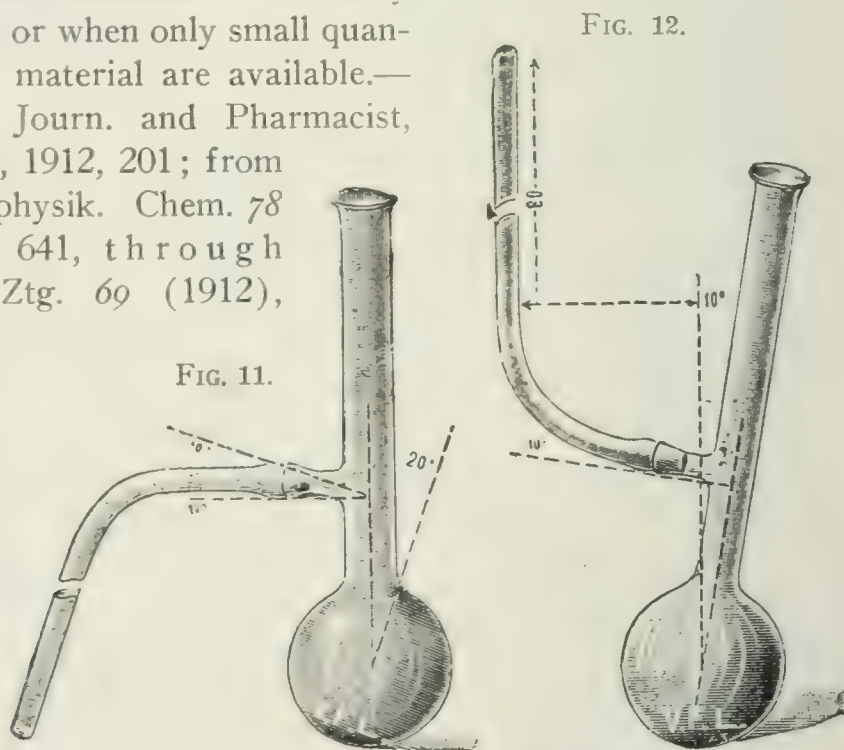


Water Still.

Autodistillator—A Distilling Apparatus for Securing Pure Distilled Water Automatically.—The distilling apparatus shown by the accompanying drawing (Fig. 10) is intended for the convenient and rapid supply of pure distilled water, and being continuous in its action, is designated by its manufacturers, Alt, Eberhardt & Jaeger, as "autodistillator." The apparatus, with the exception of the support and cooling tube, is composed exclusively of Jena glass, which is not alone free from liability to impart alkalinity to the distillate, but is

stronger and less liable to fracture than other kinds of glass. As plainly shown in the drawing, the distilling flask is provided with a constant level water attachment, which secures the continuous supply of water so long as the condensing water is permitted to flow through the cooler. When once started, no further attention is required, except to remove the filled receiver from time to time. To secure the contents of the latter from dust, bacteria, etc., the delivery tube of this condenser is provided with a hood covering the neck of the receiver, into which, if desirable, a Wattel-air filter may be enclosed. The apparatus as supplied will yield about one liter of the "purest" distilled water per hour, consuming about 12 liters of condensing water and 0.4 cubic meter of gas. —Pharm. Ztg. lvii (1912), No. 76, 768.

Fractional Distillation in Steam—Advantages over the Ordinary Method.—A. Golodetz finds that distillation in steam forms a more effective means of separating mixtures of substances insoluble in water, such as benzene and toluene, than the ordinary fractional distillation. For high-boiling mixtures the method may be used, if an efficient fractionating apparatus is available. Fractional distillation in steam is especially useful when the mixture decomposes readily on distillation at ordinary pressure or when only small quantities of material are available.—Pharm. Journ. and Pharmacist, Aug. 10, 1912, 201; from Ztschr. physik. Chem. 78 (1912), 641, through Chem. Ztg. 69 (1912), 325.



Universal Distilling Flask.

Universal Distilling Flask—Practical Form.—The "Vereinigte Fabriken für Laboratorium Bedarf" (Berlin) supply the practical

form of distilling flask, shown by Figs. 11 and 12, in two positions, the one (Fig. 11) in which the lateral tube in the neck of the flask is attached to a Liebig's condenser (not shown in the drawing) for fractional distillation; the second (Fig. 12) in which the connecting tube is turned upward and attached to a reflux condenser. The utility of this flask for various laboratory operations is obvious.—Pharm. Ztg. lvii (1912), No. 16, 156; from Chem. Ztg. 1912, No. 5.

Sterilization in the Pharmacy.—Commenting upon the proposition that Methods of Sterilization may be introduced into the new editions of the U. S. P. and N. F., E. Fullerton Cook, Ph. D., describes the equipment required by the pharmacist to dispense sterile solutions and the methods of their preparation. While these methods do not cover the whole field of sterilization by the pharmacist, they are offered as suggestions and with the hope that pharmacists generally may be encouraged to prepare for this largely-increasing demand upon their skill.—Proc. N. J. Phar. Assoc., 1912, pp. 74-77. (E. C. M.)

FIG. 13a.

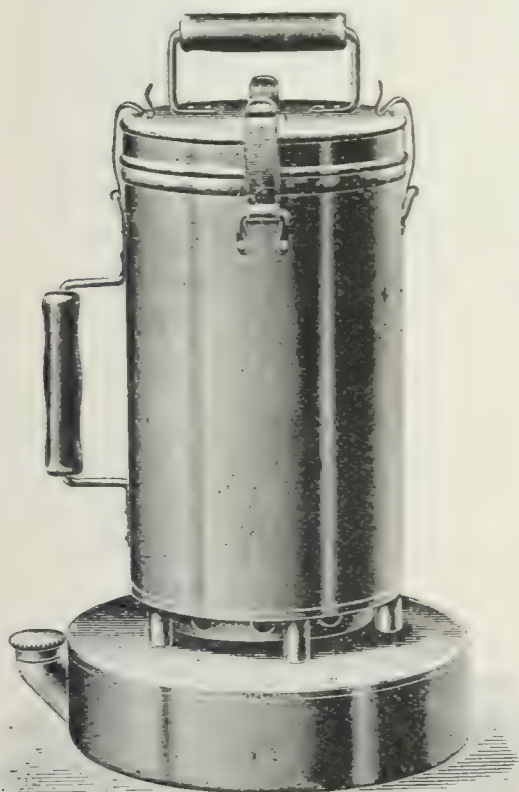
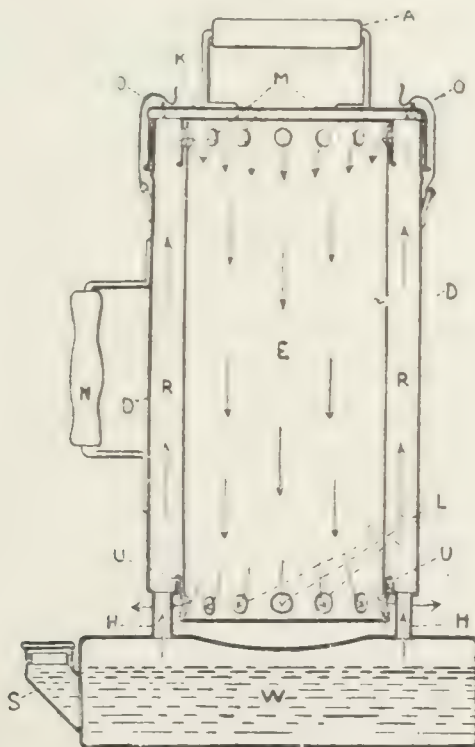


FIG. 13b.



Steam Sterilizer.

Steam Sterilizer—Improved Construction for Small Operations.—Dr. Kramer describes a new steam sterilizer adapted for sterilizing small quantities of bandaging material, which is illustrated in per-

spective by Fig. 13a, and in sectional detail by Fig. 13b. It consists of the water-boiler (*W*) joined to the steam mantle (*D*) by the steam-pipes (*H*). A removable cylindrical vessel (*E*), for the reception of the material to be sterilized, is fitted snugly into the space indicated by (*U*), and is provided with a number of holes (*M* and *L*) for the admission and exit of the steam generated in the boiler (*W*). These holes at (*M* (?) Rep.) may be closed or again opened by a simple turn of the mantle-cover (*A*). The water is filled into the boiler through and to the level of the lateral tube (*S*) which is then closed with a screw-cap. On applying heat to the boiler, the generated steam passes through the tubes (*H*) into the steam-jacket (*R*) and enters the sterilizing cylinder through the openings (*M*) above, passing downward through the enclosed material, and out of the apparatus through the openings (*L*). The new sterilizer is manufactured and supplied by the firm Friedr. Haaga, Stuttgart-Cannstatt.—Pharm. Ztg. lvii (1912), No. 23, 232.

Sterilization—Preparation of Sterile Solutions in Ampules.—M. Grübler recommends ampules of Jena glass, which does not contain free alkali. Solutions which attack soft glass or which are sensitive to free alkali are best filtered through a well glazed porcelain funnel. Before sealing the filled ampules should be warmed so as to partly create a vacuum, which precaution will prevent the breaking of the ampules during sterilization. He advises a home-made apparatus with a false bottom containing holes in which the ampules fit. Apotheker E. Gulz constructs a home-made burner, which gives a very small flame, for sealing the ampules as follows: The capillary of an ampule without a bottom is broken off, a very fine needle is introduced, which is again removed after melting the glass around it, thus leaving a very small orifice. The large end of the ampule is connected with the gas tubing.—Ph. Post, 1912, No. 43. (O. R.)

Jena Alpha-Glass Ampules—Superiority.—A new kind of ampules has recently been introduced to the trade under the name of Jena Alpha-Glass Ampules, which are made of the so-called "alpha-glass," also called "fiolax-glass." Experiments made with this "alpha-glass" by Dr. C. Stich, by exposing the finely pulverized glass to the action of different solutions under various conditions, prove the superiority of this glass over the normal glass at present in popular use, with which simultaneous parallel experiments were also made.—Pharm. Ztg. lvii (1912), No. 29, 294.

New Drying System—A Simple and Compendious Device.—Carl Woytacek has devised a new system of drying apparatus which has the advantage over the forms usually employed for drying

gases in greater stability, compactness, and less liability to fracture. The apparatus consists of a two-necked Woulf's bottle, bearing in the necks cylindrical vessels, accurately fitted by grinding, for the reception of calcium chloride, soda lime, or other desirable absorption material, while the bottle itself contains sulphuric acid, a glass tube reaching to the bottom of the bottle from the cylinder through which the gas enters, while the dried gas passes out through the cylinder fitted into the opposite neck. When not in use, the stop-cocks leading to and from the cylinders are closed, thus leaving the apparatus ready for the next operation.—Pharm. Ztg. lvii (1912), No. 32, 322; from Chem. Ztg., 1912, No. 35.

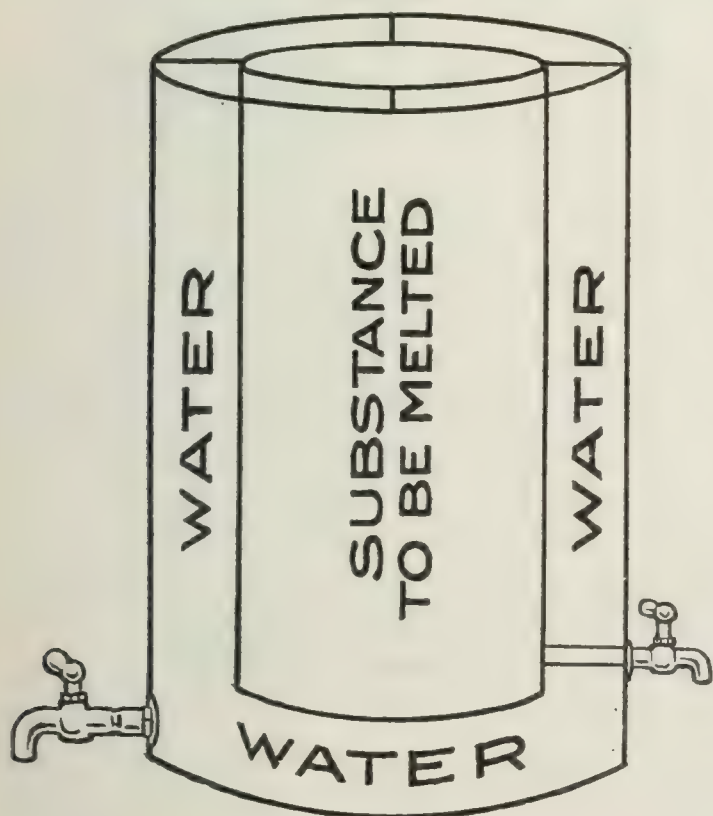
Drying Oven—Method of Raising the Temperature.—E. Cordonnier finds that the interior of a drying oven heated with boiling water reaches a temperature of only 97° or 98° C. To obtain a temperature of 102° to 105° C., he uses the following liquid, which boils at 105° and gives an oven temperature of the degree stated: Borax, 600 Gm.; Water, 1200 Cc.; Glycerin, 600 Cc. In order to avoid concentration of the solution and consequent elevation of the boiling point, the oven must be provided with a reflux condenser; and, to facilitate ebullition of the liquid, it is advisable to add a pinch of powdered pumice to it.—Pharm. Journ. and Pharmacist, Sept. 28,

1912, 402; from Bull. Sci. Pharmalog., July, 1912, 413.

Fireless Cooker — Uses in Making Preparations.—Hugh M. Reid says the fireless cooker may be successfully used in the preparation of benzoinated lard, soap liniment, camphor liniment and similar preparations. — Bull. Phar., Aug., 1912, 339. (C. M. S.)

Water-Bath — For Quickly Filling Ointment Jars.—Henry K. Schwartz describes and illustrates a

FIG. 14.



Water-Bath.

water-bath (shown in Fig. 14) adapted for filling ointment jars with petrolatum and similar substances.—Bull. Pharm., May, 1912, 209. (C. M. S.)

Protective Neck-Holder for Hot Flasks—A Convenient Device.—Spang has devised a convenient holder for grasping the neck of spirit-bottles and flasks in general containing hot liquids, which is shown *in situ* by Fig. 17. It consists of a wooden casing in two halves (*a-a*) which are held together by circular spring-bands of steel (*c-c*), cut in the center of their periphery so as to open out,

FIG. 15.

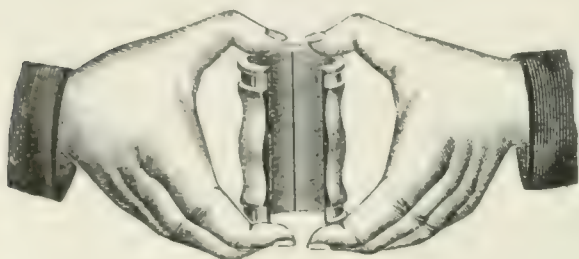


FIG. 16.

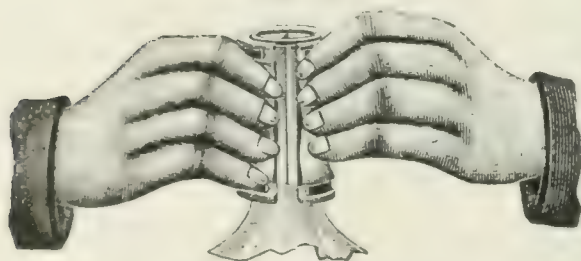
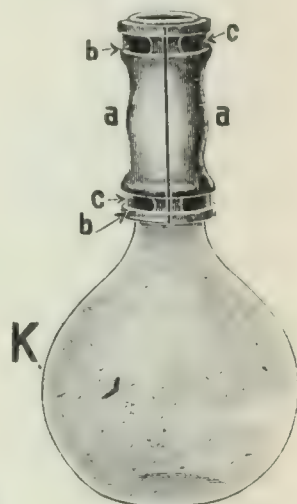


FIG. 17.

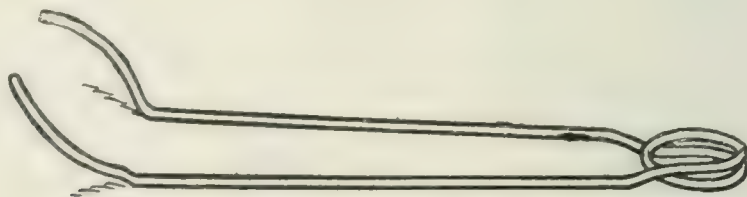


Neck-Holder.

which are fitted into grooves (*b-b*)—the method of opening and fastening the holder to the neck of the flask being shown by Figs. 15 and 16. The holder insures complete protection from the heat, and can be conveniently changed from one flask to another having similar dimensions. It is supplied by the firm Gustav Mieller, Ilmenau, Saxony.—Pharm. Ztg. lvii (1912), No. 76, 768.

Crucible-Tongs—A Simple and Efficient Form.—H. L. Bowman has used the simple form of crucible-tongs, shown by Fig. 18, during

FIG. 18.



Crucible-Tongs.

several years for handling crucibles, etc., with convenience. They are made of a piece of stout wire, coiled into a spring at the middle

and bent at the ends to form two semicircular jaws, which lie in a plane at 45° to the plane of the legs. They are about $6\frac{1}{2}$ inches long, and may be made of bright iron wire of about 0.09 inch in thickness, or of nickel wire of somewhat greater thickness to give sufficient thickness. The springiness of the legs enables a firm grasp of the crucible (with its lid on) without fear of damage, while the oblique position of the jaws facilitates the lowering of the crucible into a desicator or insertion into the balance case. Watch glasses and small capsules, resting securely on the ring formed by the partly closed jaws, are conveniently lifted and transferred.—Chem. News, April 12, 1912, 169.

Bunsen Burners—Improved Forms.—The firm of Hodes & Goebel (Ilmenau i. Th.) supply two improved forms of Bunsen burners. One of these, shown by Figs. 19 and 20, is characterized by the peculiar shape of the base (Fig. 19) which permits the close

FIG. 19.

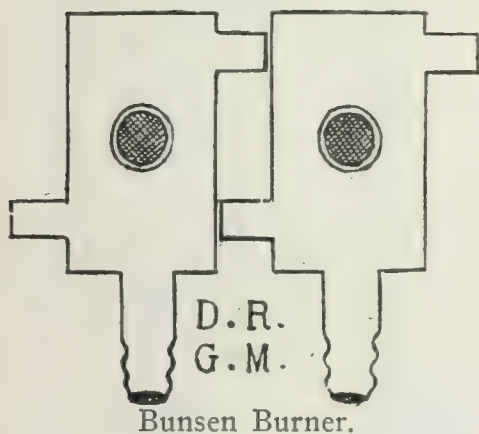


FIG. 21.

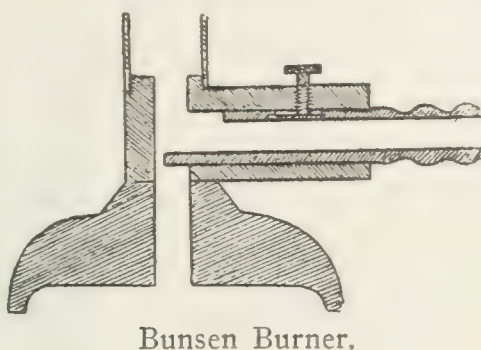
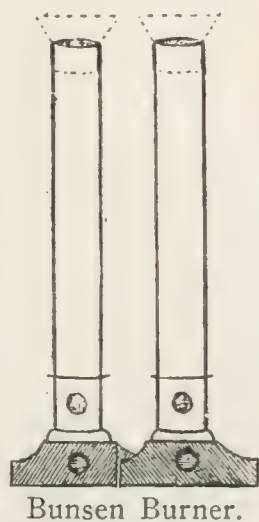


FIG. 20.



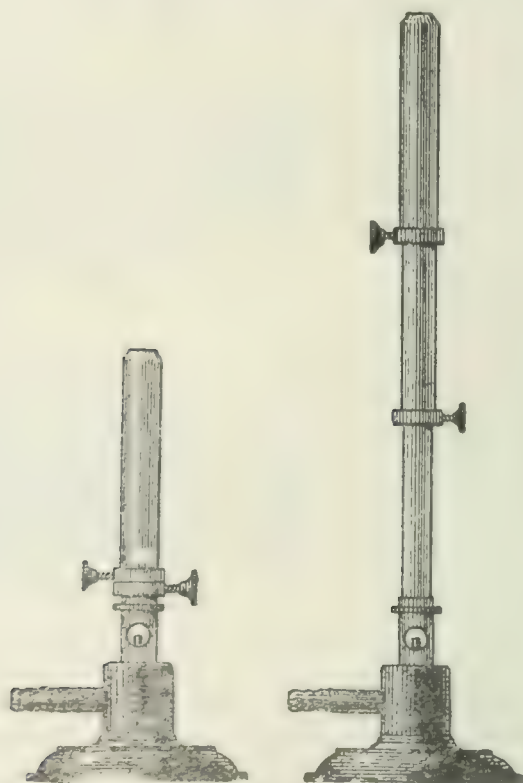
arrangement alongside of each other of a battery of the burners, this being illustrated by Fig. 20. Of course, these burners can be used singly just as ordinary burners, and have the additional advantage of a firmer base. The second new form of burner (Fig. 21) possesses the advantage over the ordinary form that the air is admitted from beneath, through the base. This permits the regulation of the influx of air by sliding the gas supply-tube inward or outward, and holding the position so given by means of a set-screw, as shown in the cut.—Pharm. Ztg. Ivii (1912), No. 94, 946; from Zschr. f. angew. Chem., 1912, No. 38.

Telescope-Bunsen Burner—A Convenient Modification.—Fr. Friedrichs has devised a telescopic form of Bunsen burner which

presents the convenience of extending the length of the tube and again lowering it while the burner is in use, and thus facilitates the modification of the flame-heat without disturbing the apparatus to which heat is being applied. The new form of burner, which is shown by Figs. 22 and 23, in the ordinary and in the extended position, the latter maintained by means of set-screws, is supplied by the firm of Greiner & Friedrichs, in Stützerbach, i. Th.—Pharm. Ztg. lvii (1912), No. 101, 1020; from Ztschr. f. anal. Chem., 1912, No. xii.

FIG. 22.

FIG. 23.



Telescope-Bunsen Burner.

Filtration of Liquids Containing Very Fine Precipitates—Preparation of Filter.—Shreds of filter paper are ground in a mortar and are mixed with plenty of water. Allow the coarser fibres to subside and pass the turbid liquid through the filter. The filter paper thus prepared will retain very fine precipitates suspended in a liquid, which will ordinarily pass through the filter.—Sc. Am., 1912, No. 26, 579. (O. R.)

Filtration of Liquids Containing Fine Precipitates.—E. Kraus prepares a so-called "cereal" by tearing ashless filter paper into minute fragments and shaking with water. This is added to the liquid containing the precipitate, f. i., BaSO_4 , and mixed well and filtered. A clear filtrate is thus obtained. (The use of shredded filter paper pulp as a clarifying agent has been practised in pharmacy for a long

while, but seems to be new to chemists. O. R.)—Chem.-Analyst, 1912, No. 6, 9. (O. R.)

"Gooch" Filters—Economical Modification.—W. R. Forbes observes that while the "Gooch" filter is very useful for quick filtrations, it has the disadvantage in that, unless much expense is incurred, one must use the same size each time. At times a large or a smaller one would be an advantage. The author suggests that by the following modification this aim can be attained: Instead of the usual washer which lies between the "Gooch" and the glass, an india rubber tire should be used. This tire would surround the "Gooch" and could be inflated to fill the space between the "Gooch" and the glass. A side tube (with a clip) to the tire would be needed to inflate and deflate it, and by this means one could use a larger or smaller "Gooch" as one pleased.—Chem. News, Jan. 19, 1912, 27.

Improved Strainer—A Convenient Utensil at the Prescription Counter.—Wolsiffer's strainer, which has been improved in some particulars, is shown by the accompanying cut (Fig. 24). It con-

FIG. 24.

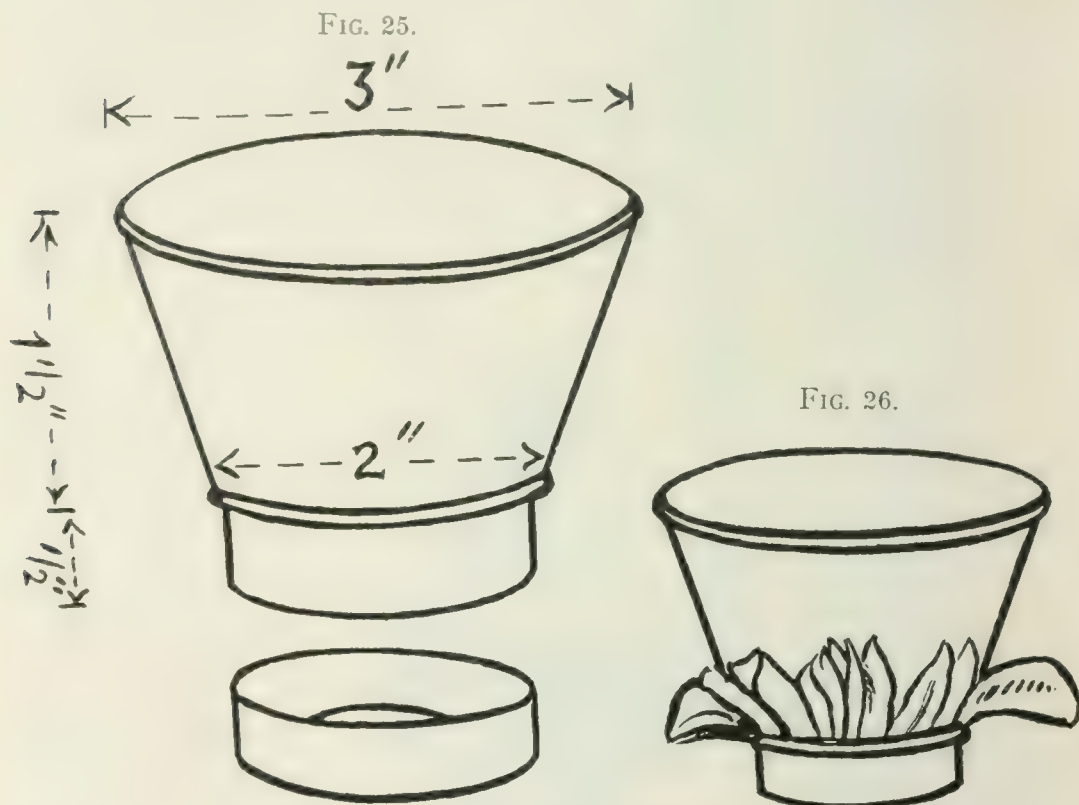


Improved Strainer.

sists of a truncated funnel or colander, the large orifice of which is closed by a perforated screw cap of sufficient depth to accommodate one or more discs of filter-material, and a perforated disc to hold the filters in place when the cap is screwed on the colander. The apparatus as supplied fits the openings of the measuring vessels in ordinary use (from 150 to 750 Cc. capacity) and rapidly strains or filters, according to the filter-medium used, solutions, syrups, in-

fusions, and similar liquids prepared or dispensed at the prescription counter.¹—Pharm. Ztg. lvii (1912), No. 79, 797.

Syphon—Improved Form for Analytical Work.—W. R. Forbes observes that the ordinary pipette is not very suitable for removing a quantity of supernatant liquid, especially if it is corrosive or poisonous. Such operations are much facilitated by the syphon shown by the accompanying drawing (Fig. 27), which is modified by the author from a form previously described by Jacobson and Dinsmore. The apparatus is constructed of narrow bore glass tubing. Glass taps are placed at *A* and *B*. A side tube

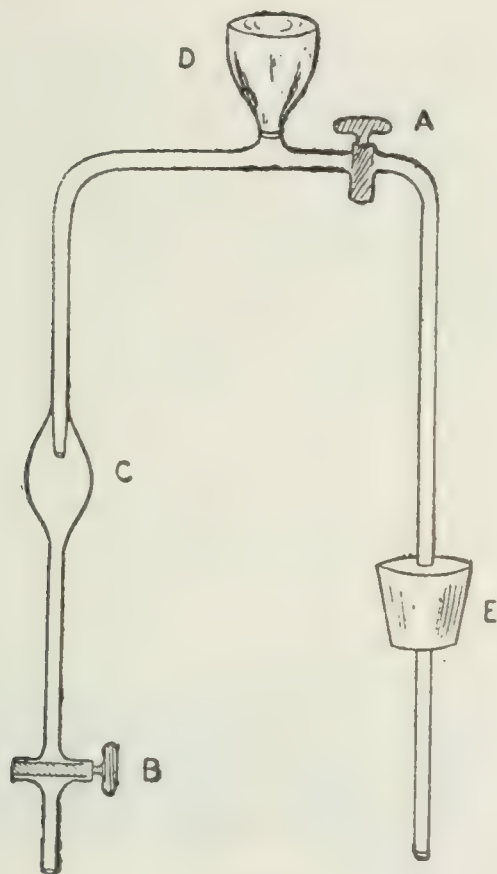


Improved Strainer.

¹*Note.*—The construction of this “improved” strainer, which is patented (in Germany), is more complicated than is necessary. Many years ago I had the tinner make me a strainer, here shown in outline (Figs. 25 and 26), which is simple, cheap and efficient, and is not patented. It consisted of a truncated conical vessel, of 3 inches diameter at the top, 2 inches at the bottom, and about $1\frac{1}{2}$ inches deep to the shoulder, from which a short straight neck extends, for the reception of a well-fitting ring of tinned iron, to securely hold one, two, or three segments of gauze in place. In due course the strainer rusted and had to be replaced; but it had lasted several years, and had proven so useful that it was replaced with one made of silver, which lasted me until I relinquished my business, and doubtless is in use now. And, in the light of its usefulness during the many years, I should not hesitate to have one made of gold, if such were a necessary improvement. (C. L. D.)

passes out to a rubber bulb at *D*. The first portion of the main stem ends in the middle of a bulb at *C*. This arrangement facilitates the syphoning. The rubber cork at *E* fits into the vessel to be emptied, and is provided with a groove to admit air. To begin the syphon

FIG. 27.



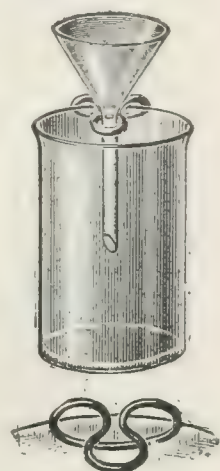
Syphon.

action, close *A*, squeeze *D*, and then at once close *B*. When *A* is opened enough fluid will pass up the tube to commence the action.—*Chem. News*, July 26, 1912, 40.

Funnel Support—Simple Construction for Attachment to Beakers, Etc.—Schmidt has devised the simple support for small funnels in filtering operations, shown by Fig. 28, which is constructed of wire and easily attached or removed from the rim of beakers, etc. The little device, which is supplied by the firm of Paul Altman, Berlin N. W., requires no explanation, but has been anticipated by a similar device of Havenhill, which is shown in “*Proceedings*,” 1909, 42.—*Pharm. Ztg.* lvii (1912), No. 16, 156.

Lipped Watchglasses—A Substitute for Test-tubes in Small Operations.—It frequently happens

FIG. 28.



Funnel Support

that reactions have to be made with very small or even minute quantities of material. In such cases Dr. Hermann Kunz-Krause finds lipped watchglasses, such as shown by Fig. 29, very serviceable. The liquid portion in case of small precipitations, for example, may be decanted by means of the lip, or beak, without loss of any precipi-

FIG. 29.

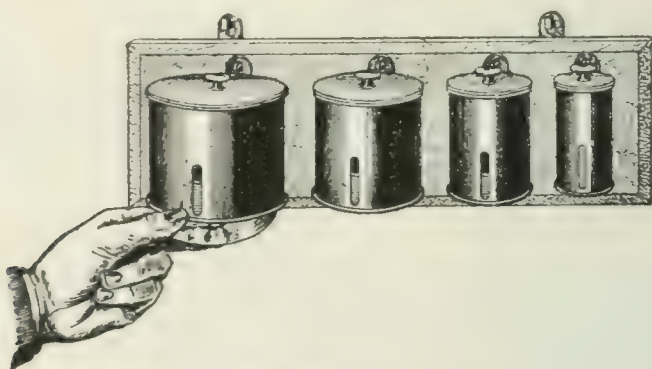


Lipped Watchglass

tate, or, on the other hand, the liquid may be decanted clear from the precipitate into another watchglass, and both subjected to further examination. If the glass is radially and concentrically divided into sections, by etching lines upon the outer surface of the glass, any object of special import, such as crystals, etc., in the sedimentary examinations may be located and thus become conveniently available for future examinations under the loupe or microscope.—Pharm. Ztg. lvii (1912), No. 5, 46-47.

Watchglass Container with Automatic Delivery—A Convenient Laboratory Device.—Müller-Holländer has devised the container for the convenient storage and quick delivery of watchglasses of various

FIG. 30.



Watchglass Containers.

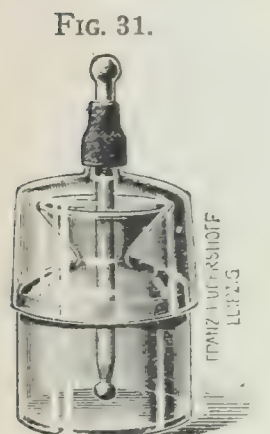
sizes, clean and ready for laboratory use, which is shown by Fig. 30, and is self-explanatory. It is supplied by L. Hormuth, Heidelberg.—Pharm. Ztg. lvii (1912), No. 85, 856.

Magnesia Rods—A Substitute for Platinum Wire in Analytical Work.—E. Wedekind has found that little rods of magnesia about 1 Mm. thick can be used instead of platinum wire in analytical work. The material is not pure magnesia, but the substance which is used for making the supports of incandescent mantles. It is very resistant and can be used for flame tests and for borax beads. Small quantities of substances can be fused or volatilized on it as on platinum foil.—Chem. News, April 26, 1912, 204; from Ber. d. D. Chem. Ges., 45 (1912), No. 3.

Capped Container and Dropping Rod for Viscous Fluids—A Useful Form for Microscopic Work.—Dr. Kunz-Krause describes the advantages and construction of a combination container and dropping rod, shown by Fig. 31, which serves admirably for microscopic work with such viscous liquids as glycerin, Canada balsam,

as well as other fluids, such as KOH solution, etc.

It consists of a small bottle, with a funnel-shaped neck, having an outer flange upon which the protecting cap accurately fits. This cap has a central, short neck, into which the dropping rod is inserted, and is held in place by a section of rubber tubing. This permits the adjustment of the rod, by slipping it up or down, so that the ball-shaped extremity shall just dip beneath the surface of the contents of the bottle. The ball-shaped extremity of the rod has the advantage of enabling the dropping of the fluid while holding the rod—with the cap attached—in a more or less horizontal position. This little apparatus is supplied

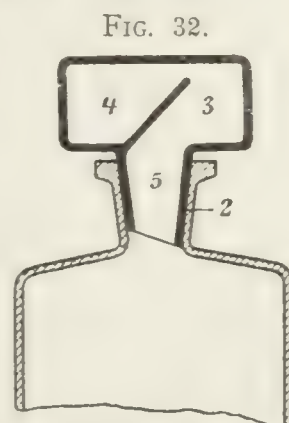


Container for Viscous Liquids.

with or without lettering, by the firm of Franz Hugershoff, Leipzig.—Pharm. Ztg. lvii (1912), No. 4, 34.

Combination Bottle and Medicine Glass—A Hygienic Device.—Heinrich Neufeld has devised a medicine bottle which is provided with a hollow ground glass stopper constructed as shown by the accompanying illustration (Fig. 32), and designed as a medicine glass by means of which the contents may be kept and administered in an aseptic condition.

The constricted part of the hollow stopper (5) is accurately ground to fit into the neck (2) of the bottle, while the large hollow space above is divided into two chambers (3 and 4) by a diagonal partition extending upward to within a short distance of the inner top. On inverting the bottle after securely stopping, the contents flow into the stopper, and on again reversing it to its upright position, the liquid returns to the bottle, leaving an accurately measured quantity, corresponding to its capacity, in compartment 4. The stopper may then be removed and its contents administered either directly from the stopper or by pouring it into an aseptic vessel provided for this purpose.—Pharm. Ztg., lvii (1912), No. 16, 156.



Combination Bottle and Medicine Glass.

Dropper.—Pinneo, Frank Wilcox, describes and illustrates a new regulating dropper for ether or chloroform that may be used on any form of container.—J. Am. M. Assoc., 1912, v. 59, p. 877. (M. I. W.)

Drop Bottle—Combination for Thick and Thin Fluids.—A new form of drop bottle, suitable for dropping thick or thin liquids has been introduced by L. Kroone, Münden, Germany, is shown by Fig.



FIG. 33.

Drop Bottle.

33. Two drop spouts are provided in the neck of the bottle on opposite sides, the lower one having a large opening for dropping dense liquids, the upper spout attached for thin fluids. In use, these openings being on opposite sides, the one serves for the admission of air while the liquid is being dropped out of the other.—Pharm Ztg., lvii (1912), No. 58, 582.

Medicine Bottles—Return to Pharmacies.—Dr. Schamelhout, at the meeting of the Brussels Pharmaceutical Society, took a new viewpoint by claiming that the pharmacist is in better position to cleanse and disinfect the used medicine bottles than the public. If bottles, once used, were to be destroyed, this would be an economic loss of about one million francs in Belgium.—Ph. Post, 1912, No. 7, 81. (O. R.)

Powder Mixer—A Convenience for the Dispensing Counter.—Wolsiffer constructs the powder mixer shown by Fig. 34, in which the principle of attrition by means of revolving balls is adapted to small operations, and particularly to avoid the necessity of trituration in a mortar. It consists of a shouldered aluminium box, with partly concave bottom and walls, and accurately fitting lid, together with a number of highly polished steel balls. In use, the prescribed medicaments are weighed directly into the "mixer," the balls are introduced and the lid carefully adjusted. On giving the "mixer" a rotary (not shaking) motion, the balls revolve with great speed and quickly reduce the ingredients of the prescription to impalpable powder and in perfect distribution throughout, without loss by dusting or other inconveniences.—Pharm. Ztg., lvii (1912), No. 79, 797.



FIG. 34.

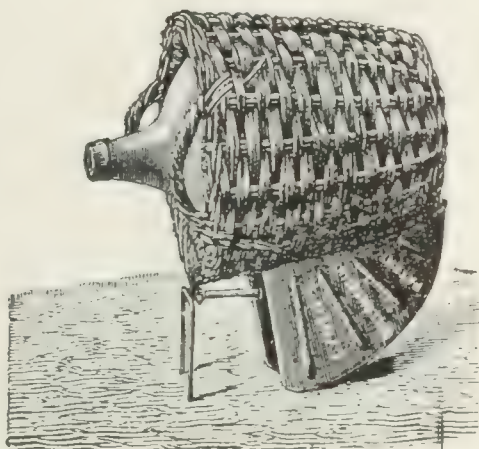
Powder Mixer.

Carboy Tilter—Convenient Device.—J. F. Ehling, Berlin, constructs the simple and practical appliance for tilting carboys and large demijohns conveniently, the application of which is illustrated

FIG. 35.



FIG. 36.

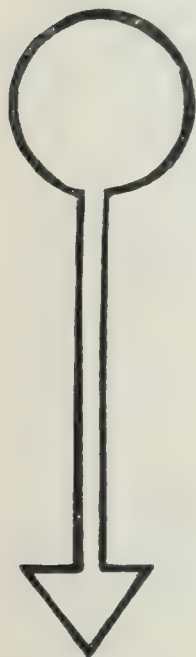


Carboy Tilter.

by the accompanying drawings (Figs. 35 and 36). The apparatus is also supplied without the two-pronged rest, which has been found unnecessary.—Pharm. Ztg., lvii (1912), No. 66, 663.

Cork Remover—A Simple Home-made Device.—Geo. Sines describes and illustrates a simple device made from a piece of wire, designed to remove cork stoppers which tend to break when a cork-screw is used and must be taken out in pieces. The device is shown by Fig. 37.—Bull. Pharm., May, 1912, 209. (C. M. S.)

FIG. 37.

Cork
Remover.

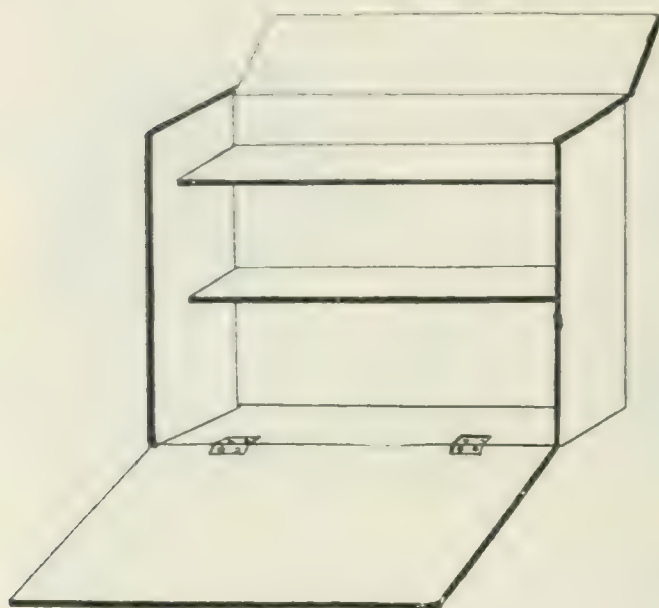
Bleached Cork.—H. Rordorf reports the purchase of a batch of handsome corks at a low figure from a firm in the south of France. Finding their odor peculiar, he gave them a chemical examination and found they contained 14/1000th of 1 per cent. of sulphurous acid, while microscopical examination showed that the bleaching agent penetrated into 0.5 Mm. of the cork tissue.

Inquiry brought out the fact that the bleached corks were treated first with diluted oxalic acid solution, then with bleaching powder solution and finally after washing with water were subjected twelve hours to the vapors of burning sulphur.—Schweiz. Wschr. of Chem. u Pharm., 1 (1912), No. 15, 214. (H. V. A.)

Reagent Case for Students—Home-made Construction.—A writer in "Chemist and Druggist" describes the home-made reagent case

shown by Fig. 38. Selecting a wooden box, with lid in one piece if possible, about seventeen inches long, thirteen inches wide, and eight

FIG. 38.



Reagent Case.

inches deep, one of the 8x17 inch sides is removed and hinged as shown. The lid of the box is also hinged, so that when closed the hinges (brass) are inside. Two shelves, two inches wide, one five and one-half inches from the bottom, the other five and one-half inches above that, completes the case. For the reagents 1-oz. and 2-oz. flat g. s. bottles are most useful—these being

placed edgewise so as to accommodate a larger number. Bunsen burner, blow pipe, test tubes and stand can also be stowed away in this case.—*Chem. & Drugg.*, July 27, 1912, 165.

Drawer With Sieve Tray—A Useful Device for Crude Drugs.—Spitz has patented a drawer for the storage of vegetable drugs which is provided near the bottom with a wide-meshed tray for the reception of the drug. The powder and vegetable particles formed inevitably during the handling of the drug, drops through the sieve-meshes, and permits the delivering of the drug in a clean and presentable condition.—*Pharm. Ztg.*, lvii (1912), No. 76, 768; from *Ztschr. d. Allgem. Oesterr. Apoth. Ver.*

C—PREPARATIONS

ACIDA.

Aromatic Sulphuric Acid—Improved Method of Assay.—L. A. Brown states that the U. S. P. method for this preparation does not give reliable results, and gives an improved method for the assay of same.

A sample of about 10 Gms. is diluted to 100 Cc. with water, 10 Cc. aliquots are titrated with N/10 KOH and phenolphthalein, which gives the "total acidity," due to free sulphuric and ethyl sulphuric acids.

The neutralized sample is then diluted to about 100 Cc., heated to boiling and 2 Cc. conc. hydrochloric acid added, followed by an excess of barium chloride.

From the amount of barium sulphate found is calculated the per cent. of "free sulphuric acid" and also the equivalent amount in Cc. of $N/10 \text{ H}_2\text{SO}_4$. This figure is subtracted from the "total acidity" and the difference multiplied by two, then calculated to per cent. of sulphuric acid as "combined sulphuric acid."

Total sulphuric equals "free" plus "combined sulphuric."

It was found that in the U. S. P. method all the ethyl sulphuric acid is not completely hydrolized by four hours' heating, and that even after eight hours' boiling, some remained undecomposed. Also that ethyl sulphuric acid is decomposed to a greater extent in concentrated solution than in dilute solution.

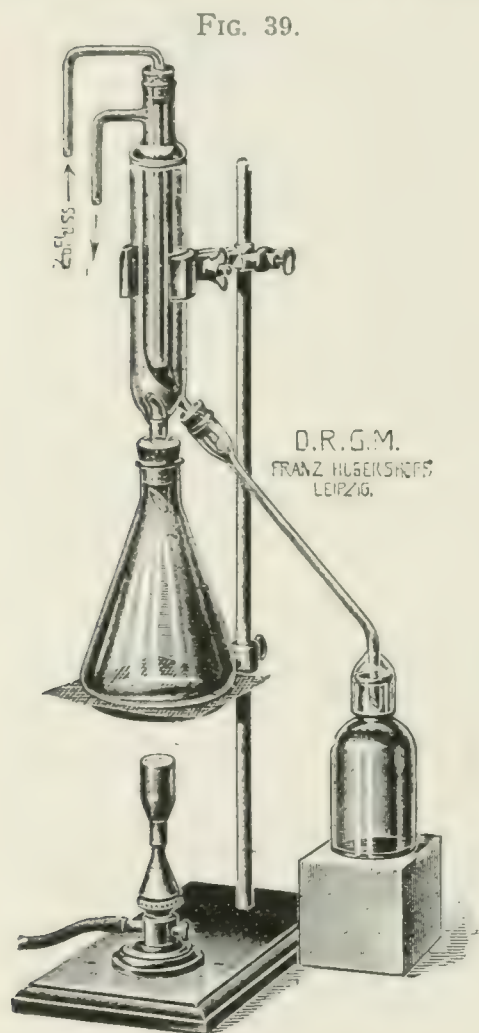
The formation of ethyl sulphuric acid in this preparation appears to be a time reaction and apparently comes to an equilibrium with one part of the acid as free sulphuric and two parts as ethyl sulphuric.—Journ. Ind. and Eng. Chem., July, 1912, Vol. 4, p. 512. (L. A. B.)

AQUÆ.

Distilled Water—Purity for Hypodermic Injections.—G. Rebière observes that a rise of temperature has so often been observed to follow the injection of the physiological salt solution, often amounting to one or two degree C., that it has been called "saline fever" and "chloride fever" by Continental writers. Wechselman has attributed this to the presence of dead bacteria derived from sterilizing old distilled water. The author shows that it is not necessary for the water to be old for it to contain much organic matter. Much of the distilled water obtained in French commerce contains appreciable quantities of free acid and organic matter. Nine such samples used up from 19 to 43 Cc. of $N/100$ permanganate per litre; and one, no less than 1,000 Cc.; but this was traced to be due to the use of a dirty carboy. The acidity in terms of Cc. of $N/10$ sodium hydroxide per litre ranged from 0.8 to 14.4 Cc. Pure distilled water prepared by the author from spring water previously boiled and distilled from a silver-lined still used up 4 Cc. of $N/100$ permanganate and 0.4 Cc. of alkali per litre. The amount of volatile organic matter present in some of these waters is attributed to their being merely condensed from boilers in which boiler compositions are used. The author considers it more important that distilled water should be free from this volatile organic contamination than that it should be recently distilled. The less pure the

distilled water is, the more readily do micro-organisms grow therein.—Pharm. Journ. and Pharmacist, April 13, 1912, 485; from Journ. de Pharm. et Chim., 1912, 300.

Sterile Distilled Water—Apparatus for Conveniently Preparing Small Quantities.—The modern demand for freshly prepared dis-



Apparatus for Sterile Distilled Water.

tilled water in a pure and sterile condition for intravenous injections has given the incentive to the construction of distilling apparatus especially designed to meet this demand, and quite a number have been proposed and described. One of the most practical forms is that shown by Fig. 39, which has been devised by Dr. Katz and is supplied by the firm Franz Hugershoff, Leipzig. It consists of a cylindrical glass cooler fitted by means of a rubber stopper into the distilling flask (an ordinary Erlenmeyer). The cooler consists of three parts, which are readily taken apart for the purposes of cleaning and are each replaceable in case of breakage. The outer mantle is provided at the base with a short, curved tubular extension to prevent the condensed distillate from returning into the distilling flask, this flowing off through the delivery tube, the extremity of which is protected with a bacteriological bell to prevent the

introduction of germs into the receiving vessel. Condensation is effected on the outside of the cooling cylinder suspended in the mantle, by water circulating through it in the directions indicated by the arrows.—Pharm. Ztg., lvii (1912), No. 66, 662.

Distilled Water—Advantageous Use in Perfumery.—The “Seifenfabrikant” calls attention to the persistent use by some perfumers of ordinary tap or well water in the manufacture of perfumery, and discusses some of the advantages accruing from the use of distilled water. Thus, for example, the addition of ordinary water to alcoholic solutions of volatile oils may, and often does, produce

turbidity which is difficult to remove by filtration, while the same quantity of distilled water would at once produce clear solution or, at most, easily removable turbidity. Moreover, the impurities in ordinary water unfavorably affect the delicate odor of many perfumes, which distilled water does not. Other products, such as cosmetics, transparent soaps, etc., are similarly affected by impurities in water, and can be avoided by the use of distilled water, which is modernly so easily obtainable that there is no reason why it should not be used in the preparation of perfumery of every description in which water is required.—Pharm. Ztg., lvii (1912), No. 86, 861.

Ærated Water—Preservative Effect of Carbon Dioxide in Proportion to Pressure.—G. D. Elsdon has made experiments showing the action of carbon dioxide under pressure on the micro-organisms in so-called "soda water." He found the number of organisms in water supplied in syphons to be low—this being in part explained by the fact that, owing to their nature, syphons cannot be used for miscellaneous household purposes and contamination from this source is consequently excluded. Water stored in corked bottles, on the other hand, which can be used for other purposes, showed a much higher content; whilst water in automatically closing bottles, with globular glass stopper, showed an intermediate amount of bacteria. The author, however, concludes that the essential reason for these differences is the pressure, which in the case of syphons is very high, whereas in the other kinds of containers there is a greater or less escape of gas and consequent reduction of pressure, which is least (among the latter) in the automatically closing bottles.—Chem. News, Nov. 22, 1912, 247.

Carbonated Waters—Estimation of Ammonia.—G. D. Elsdon and Norman Evers, having noticed that the amount of free ammonia found in carbonated waters was often small, even in the case of obviously bad waters, have found that the presence of carbon dioxide in the distillate in quantities greater than 5 parts per 100,000 seriously interferes with the color produced by Nessler's solution. From an examination of waters ærated in the laboratory it was found that an ærated water containing as much as 0.020 part of free ammonia per 100,000 might, if treated by the ordinary method, be returned as practically ammonia free. The following process is proposed as the most satisfactory method of overcoming this difficulty:—After removal of as much carbon dioxide as possible by shaking in a "Winchester," 500 Cc. of the water are transferred to the distillation flask, and 5 Cc. of N/H_2SO_4 (or more if the alka-

linity of the water requires it) are added. Fifty Cc. are then distilled off and rejected, thus removing the carbon dioxide. An equivalent quantity of $N/NaOH$ and the usual amount of sodium carbonate are then added, and the estimation of free and albuminoid ammonia proceeded with in the usual manner. Many waters were aerated in the laboratory, and examined by this process. The results on the aerated waters were practically identical with those on the original waters as regards free ammonia. The albuminoid ammonia is slightly increased by aeration, whether it is estimated by the above process or by the ordinary method.—Pharm. Journ. and Pharmacist, March 23, 1912, 394.

Commercial Bitter Almond Water—Necessity and Effect of Filtration.—Dr. T. Bohrisch observes that bitter almond water, for which the G. P. gives a process of preparation, is modernly usually the product of large manufacturers, and as supplied not always clear or at most faintly turbid as officially required. Quite to the contrary, it is often decidedly turbid and requires filtration. The author finds, however, that simple filtration through paper does not secure complete clarification. He has therefore experimented with a number of filtering media, keeping in sight the possible loss of hydrocyanic acid by absorption, which, as shown by Astruc (see "Report," 1911, p. 40) to be the case when cherry laurel water is clarified by means of animal charcoal. The author's experiments show that by using well calcined and finely levigated kieselguhr in the proportion of about two tablespoonfuls to five liters of the bitter almond water, a perfectly clear filtrate is obtained, and that the loss in hydrocyanic acid is so insignificant that it may be considered negligible.—Pharm. Ztg., lvii (1912), No. 19, 189.

Cherry Laurel Water.—Proposed preparation from the leaves of *Prunus Mississippensis* cultivated in Algeria, which see under "Materia Medica."

Aqua Caryophylli.—Milton Dunn, Sheffield, Pa., suggests the following formula for a vehicle combining the following advantages:

1. Appreciable therapeutic value.
2. Wide range as a solvent.
3. Freedom from sugar.
4. Not liable to deterioration.
5. Distinct flavor.
6. Agreeability to most people, not being suggestive of ordinary food or drink.
7. Lack of alcohol or other preservative.
8. Easily and quickly manufactured.

FORMULA.

Oil of cloves.....	4 Cc.
Tinct. of cudbear.....	50 Cc.
Alcohol.....	43 Cc.
Purified talc.....	15 grams.
Water to make.....	1000 Cc.

Triturate the oil with the talc, and with continued trituration add first the tincture, then 900 Cc. of water. Filter, return the filtrate until it comes through perfectly clear. Mix this with the alcohol and add sufficient water through the filter to make 1000 Cc.—Proc. Penn. Pharm. Assoc., 1912, pp. 296-297. (E. C. M.)

COLLODION.

Cantharidal Collodium—Criticism of the Swiss Formula.—In the last revision of the Swiss Pharmacopœia the recipe for cantharidal collodion was so changed that instead of dissolving in flexible collodion an ethereal extract of cantharides, the preparation was “improved” by “dissolving” cantharidin in flexible collodion in proportion of 1 to 250. “E. B.” calls attention to the fact that cantharidin will not dissolve in that proportion, its solubility in ether being 1 to 650 and in ether-alcohol mixture (similar to collodion) 1 to 460. He further proves his point by carefully preparing the cantharidal collodion as per directions of the present Swiss Pharmacopœia when he found considerable of the cantharidin remained undissolved. He therefore suggests a recipe consisting of cantharidin 0.2 Gm., castor oil 5 Gm., acetone 7 Gm., larch turpentine 8 Gm. and collodion 80 Gm.—Schweiz. Wschr. f. Chem. u. Pharm. 1 (1912), No. 45, 673. (H. V. A.)

CREMULÆ.

Cremulæ, or Chocolate Creams.—Sir James Saroger has thus named medicinal chocolate creams. The “cream” is prepared by evaporating a mixture of sugar and milk to the consistency of paste. Different medicaments can be incorporated into this paste, which is covered with chocolate in the popular chocolate cream drop.—Ph. Zhalle., 1912, 50, 1427. (O. R.)

ELIXIRIA.

Elixir Bismuthi Tartratis—Formula.—Thomas D. Marson and J. Harpham give the following formula for an elixir of bismuth tartrate:

Bismuth tartrate scales (which see elsewhere in this Report)	300 grains.
Distilled water.....	4 fl. ozs.
Aromatic elixir to.....	20 fl. ozs.

Prepare like “Liquor Bismuth Tartratis,” which see.

Elixir Pepsini et Bismuthi Tartratis is prepared in the same way by the following formula:

Bismuth tartrate scales.....	300 grains.
Stronger glycerine of pepsin.....	2½ fl. ozs.
Alcohol (60 per cent.).....	1 fl. oz.
Simple elixir to.....	20 fl. ozs.

Formulas are also given for:

Elixir Pepsini et Bismuthi Tartratis Compositum;

Elixir Pepsini et Bismuthi Tartratis cum Strychninæ, and

Elixir Pepsini et Bismuthi Tartratis cum Ferro.—Chem. & Drugg., Dec. 28, 1912, 947.

Elixir Ferri, Quininæ et Strychninæ Phosphatum, U. S. P.—*Improved Formula*.—W. L. Cliffe recommends the following simplified formula for the elixir of iron, quinine and strychnine phosphates, which he regards as being less liable to yield unsatisfactory results than the formula now official:

Soluble ferric phosphate.....	17.5	Gm.
Sodium phosphate.....	17.5	Gm.
Quinine.....	8.75	Gm.
Strychnine.....	0.275	Gm.
Phosphoric acid, U. S. P.....	2.	Cc.
Lactic acid, U. S. P.....	4.	Cc.
Hot distilled water.....	150.	Cc.
Alcohol.....	50.	Cc.
Aromatic Elixir, q. s. to make.....	1000.	Cc.

Dissolve the quinine and strychnine in the alcohol and add the phosphoric acid; stir until a magma is formed and then add the lactic acid, stirring until solution is effected; to this solution add 700 Cc. of aromatic elixir. Dissolve the soluble ferric phosphate and the phosphate of soda in the hot distilled water; add this solution to that previously made and enough aromatic elixir to make 1000 Cc. The process requires only a few minutes and yields a product containing the same dosage of all the ingredients as the present U. S. P. formula.—Amer. Jour. Pharm., Dec., 1912, 565.

Elixir Ferri, Quininæ et Strychninæ Phosphatum—*Modification of U. S. Formula*.—O. J. Cloughly, of St. Louis, suggests the use of sodium hydroxide in the Elixir of Phosphates of Iron, Quinine and Strychnine and the elimination of the acetic acid and carbonate of ammonia. He proposes the following formula:

Soluble ferric phosphate.....	17.500 Gm.
Quinine	8.750 Gm.
Strychnine275 Gm.
Phosphoric acid	3 Cc.
Alcohol	60 Cc.
Solution sodium hydroxid.....	q. s.
Distilled water,	
Aromatic elixir, of each.....	q. s.

Dissolve the quinine and the strychnine in the alcohol, then add the phosphoric acid and 350 Cc. of aromatic elixir. Dissolve the ferric phosphate in 30 Cc. of distilled water by the aid of a gentle heat and add the solution of sodium hydroxid to almost neutralize the solution (be careful not to get it too strong or it will throw out the alkaloids), and add enough aromatic elixir to make the product measure 120 Cc. Finally mix the two solutions and filter. Add enough simple elixir to make 1000 Cc.—Proc. Missouri Pharm. Assoc., 1912, p. 133. (E. C. M.)

Elixir Terpin Hydrate and Heroin—Improved Manipulation.—J. C. Arthur St. John says this preparation may be quickly made and without subsequent separation, if one-fourth of the glycerin be heated to 100° C., and the powdered terpin hydrate then stirred to solution. The balance of the ingredients are added in the regular manner. This also applies to other elixirs containing terpinhydrate. —Bull. Pharm., March, 1912, 123. (C. M. S.)

EMPLASTRA.

Plasters—Definition of the Different Kinds.—In the course of a comprehensive article describing the more important resins employed in the manufacture of varnishes and plasters, Dr. K. Dieterich defines the various plasters as follows:

“While the soluble potassium and sodium salt of the fatty acids are represented in the soaps used as detergents, the plasters have as their basis the insoluble lead compounds of their acids, as represented by the pharmacopœial ‘Empl. Lithargyri simplex.’ The addition of turpentine, rosin, dammar or other resins, having strong adhesive properties, convert the lead plaster into ‘adhesive plaster,’ which, however, becomes adhesive only when softened by the warmth of the body to which it is applied. This adhesiveness is modernly supplied by finely divided caoutchouc, forming the ‘Rubber Adhesive Plasters’ of the market, which contain no resins, and afford protection from air and moisture. The addition of galbanum and ammonia to the ordinary lead plaster produces the ‘Drawing Plasters’ (Zug Pflaster), the activity of which in drawing boils to a head de-

pend upon the volatile oils contained in the gum resins."—Pharm. Ztg., lvii (1912), No. 39, 394; from Farbenztg., xvii (1912), No. 22 et seq.

EMULSA.

Lecithin Emulsion—Preparation.—A homogenous lecithin emulsion, permanent for two weeks, is obtained according to J. C. Schippen by dissolving the lecithin in the smallest possible volume of toluol, shaking the solution thoroughly for ten minutes with the requisite quantity of water or salt solution, and then driving off the toluol by passing a current of hydrogen through the mixture for one to one and a half hours. After shaking up it is sharply centrifugated and finally strained through absorbent cotton.—Biochem. Ztg., 40 (1912), 189.

EXTRACTA.

Solid and Fluid Extracts—Identification Tests.—C. Glücksmann describes a number of identification tests for solid and fluid extracts in "Pharm. Praxis," as follows:

Extractum Granati.—Dissolve a few milligrammes of the extract in 5 to 10 Cc. of glycerin in a water-bath, and dilute with distilled water in a test tube, until the liquid no longer shows a yellow color in transmitted light. To about three-fourths of a test-tubeful of this liquid add 1 to 2 Cc. of a 1 in 10 solution of lead acetate, when a canary-yellow color is produced. Although the liquid appears clear, on filtering it a colorless filtrate is obtained, and a small yellow precipitate remains on the filter.

Extractum Hamamelidis Fluidum.—Mix one drop of the fluid extract with about 5 Cc. of glycerin and dilute to 100 Cc. with water, when a clear, colorless liquid is obtained; 1 or 2 Cc. of this liquid, mixed with five times its volume of ammonia solution, shows a distinct rose-red color, which changes in a few minutes to a light brown or light yellow. If another portion of the dilute extract solution is saturated with sodium bicarbonate, it remains practically colorless in the cold, but on boiling it acquires a distinct greenish-brown tint.

Extractum Hydrastis Fluidum.—To one-third of a test-tubeful of hydrochloric acid add a very dilute aqueous solution of the extract, drop by drop, as long as the mixture remains colorless; on then adding a trace of chlorinated lime and shaking, a slight rose coloration gradually develops and changes after a few minutes into a light yellow-brown.

Extractum Krameriae.—Dilute an aqueous solution of the extract until colorless, and to 10 Cc. of this add about 0.5 Gm. of sodium bicarbonate; a rose-red color gradually appears and lasts a long time; on heating the liquid becomes somewhat paler, but the color quickly returns. If a trace of extract of krameria is dissolved with warmth in about 1 Cc. of a 5 per cent. solution of sodium bicarbonate and 10 Cc. of glycerin added, the purple-red mixture shows a greenish-brown fluorescence, which becomes stronger on standing.

Extractum Scillæ.—Dissolve a few milligrammes in dilute alcohol and dilute with hydrochloric acid until the liquid is no longer yellowish in transmitted light, and divide into two parts. On boiling one part it assumes a slight yellow color; a trace of *a*-naphthol is added to the other part, and on then heating it for a few seconds it acquires a red tint like that of solution of a permanganate, which on cooling gradually changes to a darker and more bluish color, and on then diluting and filtering a colorless filtrate is obtained, a dark bluish-violet precipitate remaining on the filter.—Pharm. Journ. and Pharmacist, April 27, 1912, 537; from Pharm. Post, Feb. 24, 1912, 165.

Extractum Belladonnæ Alcoholicum, B. P.—*Modification of Formula*.—Arthur W. Nunn observes that Alcohol Extract of Belladonna, B. P., is not altogether satisfactory; it is always a sticky mass, and becomes softer with age. A more constant and far handier preparation is obtained by operating on the fluidextract preliminarily as directed in the B. P. as far as obtaining the weight of the "moderately firm extract," and finding the amount of milk-sugar required. Then treat the residue with sufficient of a mixture of 7 parts 90% alcohol and 1 part of water, to make a syrupy liquid. Now add the requisite quantity (previously ascertained) of milk-sugar, and evaporate to the required weight (about three-fourths that of the fluid extract used). The next step is to "granulate" the residue of evaporation by passing it through a No. 20 sieve; again check the weight of the mixture, and then dry by very gentle heat, making up the loss in weight at the end of the process with dried potato starch, and mixing lightly.—Pharm. Journ. and Pharmacist, March 9, 1912, 318.

Extract of Comfrey Rhizome—Value as a Healing Agent and Method of Application.—Commenting on the observations and results of Dr. Macalister respecting the remedial value of comfrey rhizome (which see under "Materia Medica"), Dr. H. Bramwell draws attention to the extract prepared from the drug and describes the method of its application to ulcers, etc. The extract is applied

in form of solution on lint, which is saturated with it. After a few hours this sets hard, and can only be removed by the prolonged application of water. Under this, as under a scab, the healing proceeds. Mucilage of comfrey rhizome has also given relief in troublesome pruritus ani. Internally the mucilage has been useful in gastralgia and other stomach affections.—Pharm. Journ. and Pharmacist, Jan. 27, 1912, 97; from Brit. Med. Journ., 1912, 1, 12.

Extract of Indian Hemp—Uselessness of Acetylation for its Standardization.—Since the pharmacological activity of Indian hemp is largely due to cannabinol, C. R. Marshall and J. K. Wood considered that the determination of the acetyl value of hemp preparation might give an indication of their strength. They find, however, that such is not the case, since there appears to be no definite relation between the pharmacological activity and the acetyl value. New charas, old charas, and extract of Indian hemp, B. P., having the relative activity expressed by 20, 1, and 16, respectively, showed acetyl value of 134, 123, and 295. A sample of cannabinol distilled from old charas had the relative activity 6, and the acetyl value 190; another sample, distilled from new charas, showed 18 and 218, respectively. The authors conclude that no simple chemical method is at present available as a substitute for pharmacological experiment in the standardization of Indian hemp preparation.—Pharm. Journ. and Pharmacist, Aug. 10, 1912, 201; from Brit. Med. Journ. (1912), 1, 1234.

Alcoholic Extract of Yeast—Curative Effect in the Treatment of Beri-beri and Polyneuritis.—It is stated by E. S. Edie, W. H. Evans, and others, discussing the curative treatment of beri-beri and polyneuritis, that an alcoholic extract of ordinary yeast, after the removal of the alcohol at a low temperature, is extremely active in curing the convulsions and lameness of birds suffering from polyneuritis. An organic base, to which the name *Toruline*¹ has been given, has been isolated from this extract. Its nitrate, which apparently has the composition $C_7H_{16}O_2N$, occurs in feathery crystals, and is not precipitated by basic lead acetate, although thrown down by phosphotungstic acid. The extract loses its activity on warming, and the active substance is apparently easily decomposed by heat.—Pharm. Journ. and Pharmacist, Oct. 19, 1912, 487; from Biochem. Journ, Vol. vi, part 3, through Nature, Oct. 3, 1912, 140.

¹See also *Yeast* under "Materia Medica" Rep.

FLUIDEXTRACTA.

Fluidextracts—Methods of Valuation.—Dr. E. Amort and Dr. W. Rothe, staff apothecaries of the German War Department, commendably discuss the progress that has been made in the methods of valuation of medicaments in general, but find that the proposed methods for the valuation of galenical preparations, such as fluidextracts and tinctures, are as yet deficient and lacking in exactness, being in many instances confined to determination of specific gravity and residue of evaporation. The authors have subjected a number of fluidextracts to examination and make a detailed report of their observation and results. In a series of six purchased samples of fluidextract of condurango they obtained in four of them figures which varied materially from those obtained with a fluidextract of their own preparation. They conclude from their results that the determination of specific gravity and dry residue of evaporation alone gives no criterion of quality, but that the shaking out process with suitable solvents, in conjunction with the determinations of dry residue, affords a valuable criterion of quality, and conscientious adherence to the prescribed process of preparation. To this should be added the determination of the tannin precipitate and of the nitrogen content of the fluidextract.—Pharm. Ztg., lvii (1912), No. 18, 175-176.

Fluidextracts.—Dr. A. Azadian presents a paper on this subject ignoring, as is usually the case with Europeans, the progress made in percolation and in preparation of fluidextracts by American pharmacists.

The paper opens with history of fluidextracts, giving the credit of their origination to T. & H. Smith, of Edinburgh (1841). The only mention throughout the entire paper of American work on the matter is the bare mention that they were first made official in U. S. P. 1850, and that repercolation originated with Dr. Squibb. The next part of the paper contains explanation of the process of percolation known to every American tyro. Among the "new" apparatus is a battery of metallic percolators for repercolation, which is nothing less than the apparatus suggested by J. A. Ferret (Ph. Jl., 1895, 538).

The paper closes with four tables showing results of analyses of fluidextracts of aconite, belladonna, frangula, cascara, coca, cola, condurango, hydrastis, ipecac and cinchona, showing density, acidity and percentages of alcohol, of total solids at 100°, of ash, carbohydrates and of active principles; the first table showing results from fluidextracts prepared by the author by method of the Swiss

pharmacopœia (percolation with partial evaporation); the second showing results from reperlcolated fluidextracts prepared by the author; the third, analyses of commercial extracts of Swiss origin, while the fourth reports on commercial products of French origin. His figures show that the fluidextracts of his own manufacture were usually stronger than the commercial article and that those prepared by him by reperlcolation contained more active principle and more total solids than those prepared by him by the official product. These conclusions, based apparently on the assay of only one sample of each fluid extract of each of the four classes, do not coincide with the views of some of the American investigators of the same problem.—Schweiz. Wschr. f. Chem. u. Pharm.—L. (1912), Nos. 24 and 25, 358 and 373. (H. V. A.)

Alkaloidal Fluidextracts—New Method of Assay.—While experimenting in the effort to devise a method of assay for fluidextract of colchicum seed, Charles H. LaWall conceived the idea of applying the sodium chloride method of "salting out" objectionable constituents, as previously used by him in the method of determining benzoic acid in catsup (see Proceedings, 1908, 373). After trying a number of plans he found that the method could be satisfactorily applied to fluidextracts generally, thereby reducing the time of making the assay, as well as the labor and solvents, by about 50 per cent.—the results being practically identical with those obtained by the more tedious standard methods, as shown in the case of a variety of typical fluidextracts exhibited by the author. The method is as follows:

"Dissolve 25 Gm. of sodium chloride in a 100 Cc. graduated, stoppered cylinder, in enough water to make 85 Cc. Add 10 Cc. of the fluidextract to be assayed and then make up the volume to 100 Cc. Agitate well for about one minute. Let stand for five minutes, agitate again and pour on a dry filter. Collect 50 Cc. of filtrate, representing 5 Cc. of fluidextract, and shake out with the proper amounts of the solvents, as directed for the final extraction of the alkaloid."

It is sometimes, although not always, necessary to return the first portion of the filtrate which comes through cloudy, collecting only clear filtrate for the final extraction. The simplicity of the method and its ease of application should recommend it for adoption wherever possible.—Jour. Amer. Pharm. Assoc., Jan., 1912, 29-30

Fluidextracts and Tinctures, Phar. Helv.—Specific Gravity and Percentage of Extractive.—Dr. Th. Knapp publishes a table showing the specific gravity and percentage of extractive (dried at

100°) of each of the tinctures and fluidextracts of the Swiss Pharmacopœia as prepared in his own pharmacy.—Schweiz. Wschr. f. Chem. u. Pharm. 1 (1912), No. 45, 676. (H. V. A.)

Liquid Coffee Extract—Preparation for Household Use.—Doering recommends the following method for preparing a liquid extract of coffee for convenient household use by simple dilution with hot water: 500 Gm. of coffee of ordinary quality and 125 Gm. of a higher grade are finely ground, macerated in 1000 Gm. of cold water during 20 or 24 hours, and then distilled until 1250 Gm. (? Rep.) of distillate are obtained. To the thick liquid residue in the retort 3 per cent. of sodium bicarbonate (20 Gm.) and 2 to 2½ liters of water are added, and the mixture is boiled during a *good* half hour. After cooling the liquid is strained from the dregs, filtered, mixed with the distillate, and filled in patent flasks, the yield being between 3000 and 3500 Gms. of extract which, according to taste or requirement is diluted in the proportions of 1:1 to 1:10 with boiling water.—Pharm. Ztg., lvii (1912), No. 31, 311.

Fluidextract of Ergot—Advantageous Use of "Syphon Percolator."—Dr. Kunze calls attention to the advantageous use of the "syphon percolator" for extracting ergot according to the process of the G. P. for the fluidextract. He finds that owing to the formation of smeary masses in the percolator, percolation is impeded and often comes to a full stop when the operation is conducted in percolators of the ordinary form. By the use of the "syphon percolator," the liquid accumulates at the bottom and is drawn upward by the syphon, the flow becoming continuous when sufficient percolate has accumulated and the syphon has been set into action. The author's description of the "syphon percolator" agrees with that usually given in American text-books, of Squibb's "well-tube" percolator.—Pharm. Ztg., lvii (1912), No. 98, 988.

Fluidextract of Ergot—Preservation.—Vanderkleed, C. E., in commenting on the purpose and limitations of the bio-assay of drugs, reports observations on the deterioration of preparations of ergot, and states that a fluidextract preserved in one-ounce ampules from which the excess of air had been removed showed practically no change after keeping for one year, while the same preparation, preserved in the ordinary way, which had been exposed to air from time to time, showed less than 50 per cent. of the original strength. He concludes that the preservation of preparations of this kind in a vacuum is a step in the right direction.—J. Am. M. Assoc., 1912, v. 59, p. 1434. (M. I. W.)

Fluidextract of Gelsemium—Application of the LaWall Modification of Alkaloidal Assay.—L. E. Sayre, applying the LaWall alkaloidal assay process (mentioned in a preceding abstract) to the assay of fluidextract of gelsemium, says that the chief difficulty encountered in this case is found with the persistent presence of the fluorescent principle—the so-called gelsemic acid. The presence of very minute quantities of this seriously interferes with the sharpness of the change of color at the end point—point of neutrality—when the final solution of mixed alkaloids is titrated. After several unsuccessful attempts to remove traces of this fluorescent principle without, at the same time, removing the alkaloid, this was accomplished as follows: The final solution of the alkaloids in chloroform is shaken with two portions, each of 12 Cc. of distilled water. This water carries with it some alkaloid which is again washed out at once with chloroform—at once, because, if the aqueous solution stands any length of time, the alkaloid seems to be lost by hydration (?).

The LaWall process applied to fluidextract of gelsemium containing a very small percentage of coloring and inert matter, works admirably; but for general purposes, or for the purpose of assaying the various fluidextracts of gelsemium of the market, which vary considerably in physical properties, the author finds considerable difficulty. He discusses this question as well as possible remedies from various viewpoints, which must be consulted in the original.—*Amer. Journ. Pharm.*, May, 1912, 193-196.

Fluidextract of Goldenseal—Variability of Unofficial Preparations.—Puckner, W. A., reports that while fluidextract of goldenseal of U. S. P. quality may be had, the examination of the so-called "colorless hydrastis" and "non-alcoholic fluidextract" of hydrastis, as found on the market, showed them to be quite variable in composition. Out of ten firms' products that were examined, but one approached the requirements for the official fluidextract of hydrastis.—*J. Am. M. Assoc.*, 1912, v. 59, p. 1157. (M. I. W.)

Liquid Extracts of Hamamelis and Hydrastis—Identification.—C. Glücksmann recommends the following tests for the identification of the liquid extracts of hamamelis and hydrastis: One drop of the extract of hamamelis is added to 5 Cc. of glycerin, and the liquid diluted to 100 Cc. with distilled water. The mixture thus obtained is quite clear and free from color. One or two Cc. are treated with five times the volume of solution of ammonia, and the mixture becomes rose-red, changing quickly to brown and then yellow. If the solution of the extract is treated with sodium

bicarbonate to saturation no result is produced in the cold, but on heating the mixture becomes greenish-brown. A very dilute solution of the extract of hydrastis is added drop by drop to 4 or 5 Cc. of concentrated hydrochloric acid until the mixture just begins to turn yellow. If now a trace of calcium hypochlorite is added and the mixture well shaken, the liquid assumes a pale rose color, which quickly fades to yellowish-brown.—Pharm. Journ. and Pharmacist, Aug. 3, 1912, 160; from *Nouv. Remèdes*, 1912, *II*, 263.

Liquid Extract of Taraxacum—Advantageous Use in Cancer.—Dr. H. J. Robson says the administration of liquid extract of taraxacum in doses of 1 to 2 drams three times a day has been followed by such very marked alleviation of pain and modification of the general symptoms that he feels justified in at once calling attention to the treatment. No opinion is expressed as to the ultimate "cure" of the three cases mentioned, but the benefit derived has been remarkable.—Pharm. Journ. and Pharmacist, June 29, 1912, 845; from *Brit. Med. Journ.*, 1912, *I*, 1181.

INFUSA ET DECOCTA.

Concentrated Infusions—Comparison with Freshly Prepared Infusions.—A. Heiduschka and Joseph Schmid report the results of comparative biological and chemical experiments made with concentrated infusions of digitalis and of ipecacuanha representing the respective drugs weight for weight, which are recommended for the extemporaneous preparation of the infusions, and of infusions prepared by the official process direct from the drug. The chemical method consisted in the determination of the extract, the specific gravity, and the ash content, supplemented in the case of digitalis by the estimation of the digitoxin content of the infusion, by the method of Keller (modified), and in the case of ipecacuanha by the alkaloid determination prescribed by the G. P. V; while the frog method of Focke was applied to the digitalis infusion for a comparison of their physiological activity. The results, which are exhibited in form of a table, prove conclusively that infusions made from these so-called concentrated infusions are pronouncedly inferior to infusions made directly from the drug, and lead to the conclusion that both infusions and decoctions should invariably be made freshly in accordance with the official requirement.—Pharm. Ztg., lvii (1912), No. 89, 898; from *Zentralbl. f. Pharm.*, 1912, No. 41.

Infusion of Senna.—Formation of Calcium Tartrate on standing, from soluble tartrates, and calcium salts contained in the leaves. See *Senna* under *Materia Medica*.

Zittmann's Decoction—Rehabilitation Into Medical Practice.—In the course of his interesting address on the biological valuation of drugs containing saponins, by the hæmolytic effect of the latter when brought in contact with blood corpuscles, Prof. Kobert, discussing the possible value of the method in clearing up some of the contradictory statements regarding the medicinal properties of sarsaparilla, directs attention to the rehabilitation of the well-known but obsolete "Zittmann's Decoction" by its readmission into the G. P. V. During the discussion following it was mentioned by Dr. Fröhlig, a member of the revision commission, that this rehabilitation of the ancient medicament was solely in consequence of the earnest recommendation and request of the medical members of the commission, who gave a decided preference to this preparation over that of "salvarsan," which had also been proposed for admission.—Pharm. Ztg., lvii (1912), No. 21, 214.

LINIMENTA.

Chloroform Liniment—Quantitative Estimation of Chloroform.—Joseph L. Mayer reviews the different methods for the estimation of chloroform in chloroform liniment, finds them lacking and suggests the following as a convenient and satisfactory process for the determination of the chloroform content: Into a test-tube having a capacity of about 85 Cc. and about 25 Mm. in diameter, place 10 Cc. of distilled water and 10 Cc. of liniment to be analyzed, accurately measured with a pipette; to prevent bumping a small piece of pumice-stone, which has previously been heated to a whiteheat and thrown into water, is added. The test-tube is connected with a Liebig condenser by means of corks and bent tubes. For a receiver use an accurate 25 Cc. cylinder graduated in tenths or fifths of a Cc., containing 5 Cc. distilled water. It is not necessary to have the condenser-tube come in contact with the water. All that is required is to have it project into the cylinder. By means of a naked flame, quickly distill the chloroform into the water contained in the cylinder. It is easy to know when the chloroform is all distilled by watching the receiving cylinder. As the chloroform distills it sinks to the bottom, then comes a lighter distillate which remains on top and is perfectly clear and then a distillate which forms a milky layer occupying about 1 Cc.; after this turbid zone has appeared remove cylinder; stopper it with a sound cork and mix by shaking thoroughly. Then remove the cork and add diluted sulphuric acid (10%) to the 25 Cc. mark and shake thoroughly. In a few moments the chloroform will have settled to the bottom in a clear layer and all that remains is to multiply the Cc. of chloro-

form by 10 to obtain the percentage of chloroform in the sample. The entire examination does not require over fifteen minutes.—*Proc. N. Y. State Pharm. Assoc.*, 1912, pp. 295-296. (E. C. M.)

LIQUORES.

Saturated Solutions—Proper Method of Making.—J. Leon Lascoff, of New York, gives the following reasons for the delinquencies of pharmacists in the making of true saturated solutions of chemicals, particularly the iodides and bromides:

1. Impurity of the salts, especially the iodides.
2. The careless methods followed in manipulation.
3. Incorrect weights and measures.
4. Working at the wrong temperature.
5. The use of containers of the wrong size.

The most accurate way of making saturated solutions is by weighing both water and the salt, shaking until dissolved and straining. He gives the following table as being approximately correct as to the amount of each salt which is required to make a fluid ounce of a saturated solution at 25° C.:

	Grams to make 100 Cc.	Grains to make one fl. oz.
Potassii Iodidum.....	99.6	456
Sodii Iodidum.....	127.5	584.3
Strontii Iodidum.....	114.9	526.
Potassii Bromidum.....	50.4	230.
Sodii Bromidum.....	72.09	329.
Magnesii Sulphas.....	56.32	260.
Potassii Chloras.....	5.69	26.

—*Proc. N. Y. Pharm. Assoc.*, 1912, pp. 320-321. (E. C. M.)

Percentage Solutions and Mixtures—Arithmetic Formula.—While alligation is generally used for a percentage solution or mixture of two substances of different percentage, F. Evers gives an arithmetic formula obtained by algebra:

a=highest per cent.

b=lowest per cent.

c=per cent. wanted, between the a and b.

Take 1 Kg of the substance with the highest percent. (a) and add x=quantity of the substance with the lowest percent (b), we obtain the following equations:

$$a + bx = (1 + x)c$$

$$a - c = cx - bx \text{ or } x(c - b)$$

$$\text{or } x = \frac{a - c}{c - b} \text{ Kg}$$

—*Ph. Zhalle*, 1912, No. 10, 262. (O. R.)

Liquor Alumini Acetici, G. P.—*Examination of Commercial Products.*—According to the experience of E. Wollschlaeger the determination of the proper quality of commercial solution of aluminum acetate by the official G. P. method of examination, taking into consideration the other tests, depends mainly on the result of the prescribed treatment with potassium sulphate. If the solution gelatinizes very shortly before the beginning of boiling in the water-bath, and then becomes perfectly clear, it may be concluded that the preparation is of the proper official composition, in particular, if preliminary titration has given approximately correct numbers.—Pharm. Ztg., lvii (1912), No. 97, 976.

Liquor Burowii—Lead Free.—H. Helch proposes the following formula:

Alum.....	6.5 Gm.
Tartaric Acid.....	2.5 Gm.
Water.....	500.0 Gm.
Solution of Lead Subacetate (Ph. Austr.).....	=25.0 Gm.

Dissolve the alum and the tartaric acid in the water, add the solution of lead subacetate, mix well, set aside and then filter. This Burow's Solution contains about 0.4 per cent. basic Aluminum Acetate and has a sp. gr. 1.005.

It is necessary to use Plumbum Aceticum Basicum Solution of the Austrian Pharmacopœia, which is identical with the preparation of the German Pharmacopœia but which is much stronger than that of the U. S. P. It is prepared by triturating 30 parts of lead acetate, 10 parts of lead oxide and 100 parts of hot water until the mixture gets a milky appearance. Sufficient water is added to make 140 parts, set aside and then filter (O. R.).—Ph. Post, 1912, 145. (O. R.)

Liquor Bismuthi Tartratis—Preparation from Bismuth Tartrate Scales.—Thomas D. Morson and J. Harpham recommend the following formula for a liquor bismuthi from "bismuth tartrate scales," which are described elsewhere in this Report:

Bismuth tartrate scales.....	1040 grains.
Chloroform.....	20 minims.
Alcohol.....	40 minims.
Distilled water to.....	20 fl. ozs.

Dissolve the scales in 10 fl. ozs. of distilled water, mix the chloroform and alcohol, add to the solution, and make up to 20 fl. ozs. with distilled water. Shake.—Chem. & Drugg., Dec. 28, 1912, 947.

Lig. Kali Arsenicosi, G. P. V.—*Advantage of Using Monocarbonate in Place of Bicarbonate of Potassium.*—Hero Krüer observes that the combination of arsenous acid and potassium bicar-

bonate is not effected at the temperature of boiling water, a temperature of 102° being required, and that by the foaming produced by the evolution of CO_2 portions of the arsenous acid are carried to the upper portions of the reagent glass, where it adheres persistently and is difficult to remove. If the bicarbonate (1.0) is replaced by monocarbonate (0.7), the required temperature is quickly reached and the frothing is practically avoided.—Pharm. Ztg., lvii (1912), No. 78, 786.

Liquor Opii Sedativus, B. P. C.—Cause of Precipitation and Remedy.—J. Manson has investigated the cause of the persistent precipitation in *Liquor Opii Sedativus, B. P. C.*, and finds this to be due to the decomposition of the calcium morphinate produced under the conditions of the method of preparation. This compound is decomposed by the carbonic acid of the air, calcium carbonate is formed and is precipitated, carrying with it the liberated morphine alkaloid, together with some extraction matter. If *Liquor Opii Sedativus* is a "desideratum," its stability might be maintained by the addition of dilute sulphuric acid, whereby an impure solution of morphine sulphate would be obtained—the lime being precipitated as sulphate. The ordinary sherry wine prescribed should also be replaced by detannated sherry. This, of course, alters the nature of the prescription, but its stability would be ensured.—Pharm. Journ. and Pharmacist, March 9, 1912, 330.

Hypodermic Quinine Solution—Formula.—G. Gaglio finds that 5 Cc. of water will dissolve 3 Gm. each of quinine hydrochloride and ethylurethane, forming a convenient and painless hypodermic solution of quinine.—Pharm. Journ. and Pharmacist, Oct. 5, 1912, 422; from Arch. Farm. sperim. 13, 273.

Potio Riverii—History.—The German pharmaceutical historian and honorary member of the A. Ph. A., Hermann Schelenz, traces the origin of this galenical to the French physician, Lazarus Rivière, latinized to Riverius, who in his *Praxis Medicacum Theoria*, Paris, 1640, orders this refreshing and antifebrile potion to be prepared from succus limonis and sal absynthii, the ash of wormwood, an impure potassium carbonate. *Potio Riverii* soon became well known and was admitted in the *Dispensatorium Fuldense*, 1791, the *Pharmacopœia Rossica*, 1803, the *Code Français*, 1818, etc.—Ph. Zhalle, 1912, No. 8, 183-185. (O. R.)

Fehling's Solution—Evolution of the Original (Empirical) to the Present-day (Exact) Composition.—O. Lüning contributes the results of an inquiry into the gradual evolution of the originally simple,

though empirical formula given by Fehling (1848), to that modernly insisted on, which requires great exactitude in the quantities of copper sulphate (34.639 Gm.) and of sodium hydroxide (51.6 Gm.) to the liter. By his original formula, Fehling simply endeavored to produce a stable solution, without reflecting upon the possible use of the reagent for the quantitative determination of glucose; he directed that 40 Gm. pure crystallized cupric sulphate be dissolved in approximately 160 Gm. water, and to the cold solution the addition of 160 Gm. potassium tartrate in 500 Gm. caustic soda solution, sp. gr. 1.12, and sufficient water to make up the total volume of the reagent to one liter at 15°C. But subsequently (1849), believing that 1 mol. of sugar corresponds to 10 mol. of cupric sulphate, he recommended the further addition of water so as to produce 1154.4 Cc. of the reagent, which possessed this relation to the sugar, and this soon led to the reduction of the cupric sulphate to 34.639 Gm. in the formula, producing the original volume of one liter. The author then interestingly describes the further evolution until the present formula, used almost universally, was adopted, this consisting as is well known, of two solutions, to be mixed in equal volumes as required, viz.: No. 1, 34.639 Gm. cupric sulphate dissolved in water to make 500 Cc.; No. 2, 51.6 NaOH (in 100 Cc. water) and 173.0 Gm. Rochelle salt in sufficient water to make 500 Cc. The author proves from the literature that the insistence on the fractions of copper sulphate and NaOH is not necessary. The quantities may be rounded off to 34 and 51 Gm., respectively, and this should be done in the published formulas for this solution.—Apoth. Ztg., xxvii (1912), No. 10, 91-92.

Liquor Sodæ Chlorinatae—Improved Method of Preparation.—E. F. Kelly, after a study of the U. S. P. process for the preparation of Solution of Chlorinated Soda and a comparison of the method for its manufacture with that of the method for *Liquor Potassæ Chlorinatae* N. F., says that the latter process is the better one for the manufacture of the soda preparation, with the necessary change of ingredients, etc., and with the correction that the final quantity should be 1000 grams.—Proc. Md. Pharm. Assoc., 1912, pp. 132-134. (E. C. M.)

Liquor Sodii Phosphatis Compositus, U. S. P.—Modification of Formula.—Mitchell Bernstein has conducted a series of experiments using both the U. S. P. and many suggested modifications of the formula for compound solution of sodium phosphate, which lead him to the conclusion that the principal difficulty lies in the variability of the sodium phosphate used. He finds that when the

crystallized salt is replaced by an equivalent quantity of the official anhydrous salt (*Sodii Phosphas Exciccatus*) there is no difficulty whatever in preparing a clear, colorless, sparkling and permanent preparation; but such a salt is difficult to obtain on the market, and the only remedy is to prepare the anhydrous salt by the directions of the pharmacopœia. The formula and manipulation suggested by the author is as follows:

Add the sodium nitrate, 40 Gm., and citric acid, 130 Gm., to 150 Cc. of distilled water contained in a flask, then add the anhydrous sodium phosphate, 396.6 Gm. (equivalent to 1000 Gm. sodium phosphate, U. S. P.). Dissolve by the aid of heat of water bath. Make volume up to 1000 Cc. and filter while warm into a sterilized container—stoppered with a sterile plug of absorbent cotton. Samples made in this way have been exposed to varying temperatures during three years and now give no evidence of any change whatever.—*Amer. Journ. Pharm.*, Sept., 1912, 399-400.

MELLITÆ.

Medicated Honeys—Identification and Examination.—Dr. R. Frey communicates some valuable data for the identification and examination of medicated honeys, which are frequently purchased from the wholesale dealer and for which, in the absence of reliable data, the examination is usually perfunctory, consisting of the determination of the specific gravity and observation of their appearance, odor and taste. The author's experiments lead him to recommend the polariscopic examination of the honey for the identification of the quantity and quality of the honey used for this preparation. In the case of the dark honeys, such as honey of rose, of eucalyptus, or oxymel of squill, a process of decolorization must precede the examination under polariscope, which is carried out as follows: 10.0 of the honey are dissolved in a 100 Cc. flask in 75.0 water, 10.0 solution of lead sub-acetate are added, and this is followed after some time with the addition of 3.0 anhydrous sodium sulphate with vigorous shaking. After standing half an hour, the contents of the flask are adjusted with water at 15° to 100.0, then well shaken and at once filtered. The filtrate, which is at most faintly yellow, is then examined polarimetrically, both before and after inversion, in the usual manner, the data obtained being calculated according to Windisch's table. The identification of the particular honey under examination is effected by extracting 5.0 to 10.0 of the honey with 10.0 ether, filtering through a dry filter, evaporating the ether by dipping the beaker into warm water and observing the odor of the residue: Pure honey leaves its characteristic aroma; rose honey

and borax honey, the odor of rose oil; eucalyptus honey, that of eucalyptol, and oxymel of squill that of acetic acid ester. The addition of 1 per cent. resorcin-hydrochloric acid to the residues produces a red color with pure honey and oxymel of squill (not cherry red, as with invert sugar), and faint coloration with the other honeys mentioned.—Pharm. Ztg., lvii (1912), No. 71, 719.

MISTURÆ.

Medicinal Mixtures—Potential Increase of Activity.—Dr. J. Abelin observes that the pharmacological activity of medicinal mixtures has during recent years formed the frequent subject of scientific study. He says it is a well recognized fact that two medicaments, administered together, will under circumstances exert a much more potent effect than either of them by itself in corresponding doses. In surgical practice also, it has been experienced that by the judicious combination of two narcotics a better and more lasting narcosis is produced than is possible by the use of one of the narcotics by itself. Moreover a dose of a medicament which by itself is ineffective, may acquire pronounced potency by the addition of insignificant quantities of a second substance which, given by itself, would be without any effect whatever. Another important observation is the increased potency acquired by a medicament where it is administered in broken doses, as for example when morphine is given in small sub-divided doses at short intervals, by which a stronger and more lasting narcosis is produced than when the entire dose is given at once. The author gives numerous examples, quoting the experience of a number of investigators—Schneiderlin, Krawkow, Fühner, Bürgi, Blening, and others—and sums up the results of his review in the following sentences:

Increased potency of activity may be expected by the combination of two medicaments; first, when both medicaments belong to different pharmacologic-chemical groups; second, when to the dose of a medicament, ineffective by itself, a very small quantity of some other corresponding medicament is added; and third, when the stated dose of a medicament is given in divided portions at short intervals.—Parm. Ztg., lvii (1912), No. 79, 796.

Mistura Bismuthi Tartratis Composita—Formula.—Thomas D. Morson and J. Harpham recommend the following formula for preparing a bismuth mixture from bismuth tartrate scales (which see elsewhere in this Report):

Bismuth tartrate scales.....	800 grains.
Chloroform.....	80 minims.
Alcohol (60 per cent.).....	2 fl. ozs.
Solution of strychnine hydrochloride.....	300 minims.
Diluted hydrocyanic acid.....	320 minims.
Tincture of cudbear.....	½ fl. oz.
Distilled water to.....	20 fl. ozs.

A formula is also given for:

Mistura Bismuthi Tartratis Composita cum Pepsino, which differs by the addition of

Stronger glycerin of pepsin.....	2 fl. ozs.
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Both preparations are made according to the direction given for the preparation of "Liquor Bismuthi Tartratis," which see elsewhere in this Report.—Chem. & Drugg., Dec. 28, 1912, 947.

Mistura Rhei et Sodæ—Improved Formula.—Adolph P. Marquier suggests a change in the formula for Rhubarb and Soda Mixture, the present formula, in his opinion, containing too much glycerin and too much spirit of peppermint. He suggests the following as an improved formula for this preparation:

Sodium bicarbonate.....	35 grams.
Potassium carbonate.....	3 grams.
Fl. ext. rhubarb.....	15 Cc.
Fl. ext. ipecac.....	3 Cc.
Spt. peppermint.....	15 Cc.
Alcohol.....	100 Cc.
Glycerin.....	250 Cc.
Water, sufficient to make.....	1000 Cc.

Dissolve the sodium and potassium salts in 500 Cc. of water. Add the fluidextracts to the glycerin and alcohol and spirit of peppermint and enough water to make 500 Cc. Add this to the above solution and allow it to stand twenty-four hours and filter—Proc. New Jersey Pharm. Assoc., 1912, p. 72. (E. C. M.)

OLEA.

Oleum Phosphoratum—Proposed Restoration Into the G. P.—Dr. T. Bohrisch expresses regret that phosphorated oil was not re-admitted into the G. P. at the recent revision. The reasons for its deletion, uncertainty of reliable formula, methods of valuation and preservation, no longer exist; the researches of numerous competent investigation have demonstrated that formulas can be supplied for stock preparations of definite strength and stability, from which the medicinal solutions, such as phosphorated cod liver oil, for example, may be made, and that a convenient method for the valuation of the stock preparation can also be given. The more dilute of these stock preparations (0.2 to 0.1 per cent. P.) do not

require preservatives, but the more concentrated (0.5 to 1.0 per cent. P.), must contain a preservative, which may be either absolute alcohol, ether, or orangeoil-limonen. For the dilute form (0.1 per cent. P.) olive oil may be used, but expressed oil of almond is preferable and may be used also for the stronger phosphorus solutions; but the ideal solvent is liquid paraffin (petrolatum liquidum) and this is recommended by the author for preparing the more concentrated solution, preferring the strength of 0.5 per cent. P.=‘1 Gm. P. to 200 Gm. of oil with 5 per cent. of ether as preservation). The method of preparation is similar to that which has been well described in other authoritative formulas, the phosphorus being cut into thin slices under water, trimmed, weighed superficially, immersed in ether dried with filter paper and weighed accurately. Of this 1 Gm. is dropped into a tarred g. s. bottle containing about 20 Gm. liquid petrolatum; the preservation (=5 per cent. of ether) and sufficient liquid petrolatum are then added, to make the total contents weigh 200 Gm. The bottle being securely stoppered, it is heated in a water bath at 60° C. with frequent shaking until the phosphorus is completely dissolved and is then allowed to cool slowly. When cool the loss of ether, if any, is restored with a sufficient additional quantity; the finished phosphorated oil is allowed to stand 24 hours and then decanted from any sediment—under proper observance of the method of preparation probably not present—into small glass-stoppered containers, of brown glass, which should be completely filled. Phosphorated oil prepared and preserved in this way has been kept for three and one-half years without change. When freshly prepared it showed by Enell’s method of valuation 0.005 Gm. combined phosphorus (as phosphorous acid) and 0.972 Gm. of free phosphorus in 200 Gm. When examined three and one-half years later the values were found to be 0.002 and 0.962 respectively, showing a loss of 10 mgm. of free phosphorus, which is negligible.

The method of valuation, which is that proposed by Enell, is described in detail. It will suffice here to mention that it is based on the well-known reaction between phosphorus and alcoholic iodine, resulting in the formation of ethyliodide and phosphoric acid—the latter being determined alkalimetrically and calculated as free phosphorus, corrected by deducting the acid (phosphorous) found by a separate determination in a portion of the same oil.—Pharm. Ztg. lvii (1912), No. 56, 561-562.

Oleum Ricini Sulphuratum—*A New Chemical Compound Compatible with other Medicaments*.—M. R. Huerre describes a new

sulphur compound and the method of its preparation. It is obtained by the action of sulphur upon ricinus oil at a temperature of 140° the reaction reaching its maximum between 155° and 165° C. When sulphur and ricinus oil are heated up to 100° , simple solution of the sulphur is effected, the latter being precipitable as such by the addition of solvents; but the product obtained at the higher temperatures is apparently a distinct chemical compound, which, with a content of 4.2 per cent. of sulphur no longer responds to the ordinary reactions of that element. The sulphurated oil is miscible without decomposing solutions of various substance which under ordinary conditions are readily decomposed by sulphur. It is soluble in all proportions in acetic acid, amylalcohol (even when mixed with ethylalcohol), in ether, ethylacetate, amylnitrite, amylacetate, methylsalicylic ether, many volatile oils, chloroform, carbon bisulphide, creosote, guaiacol, benzin (benzene ? Rep.), xylol, etc. This property, and the fact that it is not incompatible with many of the medicaments used in dermatological practice, would seem to make it a valuable adjunct for the treatment of skin diseases. Thus, by means of ethereal solution, combinations with salicylic acid, pyrogallol, resorcinol, menthol, salol, thymol, etc., may be effected; in acetone solution, oil of cade, camphor, and menthol; in chloroform solution, chrysophanic acid, pyrogallic acid, resorcin, etc.; in short, it may be incorporated with any of the substances named, with collodion, traumaticin, plasters, and liniments in any desired combination.—Pharm. Ztg. lvii (1912). No. 47, 478; from Les Nouv. Remèdes (Paris), 1912, 193 et seq.

PETROLATA.

"Liquid Petrox"—*Objection to the New Formula Proposed.*—John K. Thum observes that the adoption of the proposed formula in place of the present one in the N. F. for Petrolatum Saponatum Liquidum, or "Liquid Petrox" as it is more commonly called, would be an unwise step. The present one is very readily made, never necessitating the use or application of heat; saponification begins at once and in less than a moment's time is complete. "Hold on to those things that are good" should be the aim of the committee of revision of the N. F., and in the present case the formula is good. The addition of a small amount of essential oil to it, to disguise any disagreeable odor the preparation might have, cannot be objected to. In order to place the matter before the committee of revision in a concrete form, the author advises the retention of the present formula with the addition of an essential oil as follows:

Liquid petrolatum.....	100 Cc.
Oleic acid.....	50 Cc.
Spirit of ammonia.....	25 Cc.
Oil of lavender.....	3 Cc.

The oil of lavender is to be added when the mixture of the other ingredients has cooled to the normal temperature. Liquid petrox should be kept in a dark place.—*Amer. Journ. Pharm.*, Mar., 1912, 119-120.

PILULÆ.

New Pill-Excipient—Practically Universal Utility for Massing.—T. B. Phillips discusses the difficulties in deciding upon the proper excipient to use in making pill-masses, and gives a number of examples. He has found, however, that the nearest approach to a universal excipient is obtained according to the following formula and directions:

Gelatin	℥ij.
Glycerini	℥ij.
Pulv. sacchari	℥iij.
Aq. dest. ad.....	℥j.

Place the gelatin in a tared evaporating-dish with about $\frac{1}{2}$ oz of distilled water, and allow to stand for some minutes. Next add the glycerin, and heat the mixture until the gelatin is dissolved. Then add the sugar in powder, and continue the heating until the product weighs 480 grains. Transfer the contents to a covered pot, and stir until cool. As the liquid begins to set to a solid, stir briskly with a spatula in such a way as to work a certain amount of air into the product. This serves the double purpose of making the preparation whiter and softer. The author has given the name "Massol" to this new excipient, which keeps well and needs no preservative.—*Chem. & Drugg.*, April 6, 1912, 53.

Blaud's Pills—Permanency.—Charles H. La Wall, from an analysis of some carbonate of iron pills said to be at least forty years old, says that the results show that for permanence these pills when properly made are in the highest possible class.—*Proc. N. J. Pharm. Assoc.*, 112, pp. 73-74. (E. C. M.)

RESINÆ.

Brown Scammony Resin—Characterization.—As a result of a comprehensive study, Dourdier characterizes a properly prepared brown scammony resin, as follows: When dried to constant weight at 100° the resin should not lose more than 3 per cent. of its weight, and it should have the following solubilities: In ether of 66°, at least 95 per cent.; in alcohol of 95°, from 98 to 99 per cent.; in

chloroform, 90 per cent.; in crystallizable benzol (benzene), 90 per cent.; in carbon bisulphide, 5 to 6 per cent.; in petroleum ether, 5 to 6 per cent.; in oil of turpentine, practically insoluble. Its melting point is between 118° and 122° ; optical rotation of a 4 per cent. solution in 95% alcohol, -20° to -23.5° (the ethereal solution, somewhat higher); ash, not to exceed 0.25 per cent.; acid value, at most 21; sapon. value, at least 235. Should give a red or rose color with sulphuric acid.—Pharm. Ztg. lvii (1912), No. 30, 303; from Journ. de Pharm. et Chim., 1912, No. 3-5.

Genuine Scammony Resin—Difference in Action from the Resin of Fusiform Jalap.—According to L. Bourdier's researches, fusiform jalap resin cannot be considered, as has been claimed, to be a substitute for scammony resin. Investigations recently conducted by Bourdier show that the latter, when pure, is a reliable and effective laxative in doses of 4 grains; and a purgative when 8 grains are given. The ether-soluble portion is the active principle. The resin insoluble in ether is without laxative action. Resin of fusiform jalap, in 8-grain doses, is also an active purgative; but it is also emetic; in 4-grain doses it causes nausea. Both the ether-soluble and ether-insoluble portions of this resin are active. The former is a drastic purgative in doses of 8 grains, followed the next day by vomiting after each meal, and the day after by violent colic. The ether-insoluble portion is very irritant to the mucous membrane. An 8-grain dose occasioned frequent but scanty alvine evacuations, with dull pain, and followed by sharp colic.—Pharm. Journ. and Pharmacist, April 13, 1912, 485; from Journ. de Pharm. et Chim., 1912, 252.

Scammony Resin—Applicability of Iodine for Microchemical Examination.—L. Lutz points out the availability of iodine for the microscopic examination of scammony resin. If a drop of iodine water is added to the powdered resin a syrupy mixture is formed in which the contours of the resin particles become rounded and are only faintly discernable. In inferior sorts this formation of syrup does not occur, and starch, if present, becomes blued.—Pharm. Ztg. lvii (1912), No. 23, 232; from Bull. des Scienc. Pharmacolog., 1912, No. 2.

Jalap Resin—Comparison of Different Methods of Determination.—The recent recommendation by H. North of certain modifications of the methods heretofore in use for the extraction of jalap resin (see Yearbook, A. Ph. A., 1911) has prompted Dr. P. Siedler to make a comparative study of this method, that of the G. P. V. and

of that recommended by Fromme in 1902. The results obtained by the three methods, carried out on two different samples of jalap, were as follows:

By Frommes' method, sample No. 1 yielded 7.20%; sample No. 2, 10.34%.

By the G. P. V. method, sample No. 1. yielded 7.78%; sample No. 2, 10.48%.

By North's method, sample No. 1 yielded 7.42%; sample No. 2, 10.45%.

It follows, that the differences in results by the three methods are insignificant. Moreover, the method of North, depending mainly on the uniform moistening of the jalap powder with water before extraction with alcohol is tedious, while the method of the G. P. V is not alone the most simple of the three, but also affords the best yields. Nevertheless, the author considers the G. P. V method susceptible of improvement in certain directions, which are most satisfactorily consulted in the original.—Pharm. Ztg. lvii (1912), No. 2, 15.

SAPONES.

Bismuth Soap—Preparation.—E. Wagner proposes the following method: A mixture of cacao butter and wool fat is heated to 50° C. and when cooled to 32° C. a solution of sodium hydroxide is added to it in a thin stream with constant stirring. The bismuth salt, either the subnitrate or subgallate, is then added, together with the necessary perfume and the entire mass is kneaded until it cools.—Ph. Zhalle, 1912, 50, 1429. (O. R.)

Cresol Soaps—Variable Quality as Supplied for the Use of Midwives.—An examination by Prof. Arnold of twelve different samples of cresol soaps, which, prepared for the use of midwives according to the G. P. V, should contain 50 per cent. of crude cresol, 35 per cent. of soap, and 15 per cent. of water, proved that only two of the samples conformed within a reasonable limit to the official requirement. The variation observed fluctuated between 34 and 54 per cent. cresol, 22 and 40 per cent. soap, and 14.5 to 37 per cent. of water. The author therefore recommends a return to lysol in the practice of midwifery, which offers a guarantee of uniformity not assured by the pharmacopœial formula, since pharmacists usually rely upon the product supplied by manufacturers. Pharm. Ztg. lvii (1912), No. 20, 198; from "Disinfektion," vol. 5, (1912), No. 2.

In a lengthy rejoinder, Otto Schmatolle points out that Professor Arnold's unfavorable conclusions are based on erroneous analytical data, and that the correct percentage composition of the cresol soap in question—liquor Cresoli saponatus, G. P. V, is as follows:

Cresol	50 %
Potassa-Linseed oil soap.....	32.5%
Glycerin	3.2%
Water	14.3%

This is also the percentage composition of "lysol," and consequently it does not follow that it is an absolute desideratum to resort to the latter by preference. Nevertheless, the author admits that the formula of the G. P. V is not a happy one, since it is fitted only for the theoretical practice and not for the practical laboratory. The author therefore points out the directions in which the formula is defective, and suggests a method adapted for its successful preparation with assurance of uniformity and reliability.—Pharm Ztg. lvii (1912), No. 27, 270-271.

Soap Hand Paste.—The following formula is recommended:

Soft soap	80 parts
Ammonia water	5 parts
Pumice in powder.....	31 parts
Oil of turpentine—a sufficient quantity to form a soft paste	

This can be filled in boxes and also in collapsible tubes.—Ph. Zhalle., 1912, 46, 1312. (O. R.)

SPIRITUS.

Medicated Spirits of the G. P. V—Change in Method of Distillation.—In the preparation of medicated spirits by distillation, the G. P. has heretofore directed the preliminary maceration of the drug in alcohol and water and subsequent distillation by the heat of a steam bath. The G. P. V now directs maceration in alcohol and distillation by passing steam directly into the still; but Wieblitz finds that by this method the yield and specific gravity of the product are no longer coincident with those of the product obtained by the method previously prescribed.—Pharm. Ztg. lvii (1912), No. 79, 796.

Spirits—Effect of Storage on Composition.—S. Mathiea describes the results of experiments undertaken to study the effect of the method of storage on the composition of spirits. The experiments were made on bottles filled or half-filled with a spirit of 82.9 per cent. of alcohol, corked and sealed, or merely closed with a plug of cotton. Analysis of the contents after periods of thirty-three and one hundred and four days at 18° C. and 12° C., and in varying lights, showed that no loss occurred in the corked bottles, but that the plugged bottles suffered to the extent of 0.5 to 2.1 per cent. of the alcohol. The acidity increased in all cases, the increase being accelerated by contact with air, by higher tempera-

ture, and by intensity of light. The ester content increased similarly; the aldehyde content diminished in proportion to the degree of contact with air.—Pharm. Journ. and Pharmacist, Aug. 17, 1912, 233; from Bull. Assoc. Chim. Sucr., 29 (1912), 772, through Journ. Soc. Chem. Ind., July 15, 1912, 655.

Spiritus Aetheris Nitrosi—Method of Preservation.—This preparation should never be kept in bulk, but should be immediately placed in one or two ounce containers, tightly-stoppered and sealed with paraffin or wax, and these kept in a cool, dark repository. The paper is accompanied by a table showing the desirability of the latter method in the preservation of this preparation over the way usually practiced.—C. B. Jordan, Proc. Ind. Pharm. Assoc., 1912, 53-54. (E. C. M.)

Sweet Spirit of Nitre—Manufacture and Storage.—In order to determine the cause of the trouble connected with the method of manufacture and the storage of this preparation, Dr. Linwood A. Brown made an exhaustive study of this preparation, conducting a series of experiments to determine its permanency as prepared with absolute alcohol and with U. S. P. alcohol, and as kept under varying conditions, and concludes that, from the result of these experiments, it is demonstrated that absolute alcohol should be used in its preparation, and that it should be stored in small containers protected from the light.—Proc. Kentucky Pharm. Assoc., 1912, pp. 134-136. (E. C. M.)

Aromatic Spirit of Ammonia—Improved Process of Preparation and Method of Assay.—In the course of examination of a number of samples of aromatic spirit of ammonia which had been collected by the drug inspector for the Kentucky Agricultural Experiment Station, Mr. Linwood A. Brown's attention was directed to the unstable nature and the unsatisfactory formula for the official preparation. His experimental study of the causes convinced him that the chief fault in the formula resides in the employment of the official ammonium carbonate, which is a mixture of the bicarbonate and carbonate, and is liable to vary in the proportions of these components according to the degree of exposure to the air. On the other hand, ammonium bicarbonate, which is now on the market, has a uniform composition, is quite stable, and consequently not liable to change. He therefore conceived the idea of employing this stable salt in place of the ammonium carbonate at present official, in the proper proportions, and records results which led him to recommend the following formula as yielding uniformly a satisfactory preparation:

Ammonium bicarbonate (99 per cent.).....	42.0 Gm.
Aqua ammonia (9.98 per cent. NH_3).....	125.0 Cc.
Oil of lemon.....	10.0 Cc.
Oil of myristica.....	1.0 Cc.
Oil of lavender flowers.....	1.0 Cc.
Alcohol.....	700.0 Cc.
Distilled water, q. s., to make.....	1000.0 Cc.

His directions are essentially the same as those now given, but the period of contact of the ammonium bicarbonate and the ammonia water (with 125 Cc. of distilled water) is prolonged to 48 hours, before adding the solution to the alcohol containing the volatile oils.

The absence of a published method for the satisfactory examination of aromatic spirit of ammonia, made it necessary to devise a method, which is an adaptation of old methods, and which the author has found quite satisfactory. He records his experimental data in detail, but it must suffice here to say that it consists in the determination: (1) of the total NH_3 ; (2) of the total CO_2 ; and (3) of the total alcohol. Knowing the amount of total NH_3 , and of ammonium carbonate, in grammes per Cc., it is easy to calculate the amount of hydroxide present.

Multiply the amount in grammes of ammonium carbonate U. S. P. found, by 0.3255, equals grammes of NH_3 existing as carbonate.

Total NH_3 , minus NH_3 as carbonate, equals NH_3 in form of hydroxide.

The U. S. Pharmacopœia formula calls for 10 per cent. NH_3 by weight in aqua ammonia and which has a specific gravity of 0.960, therefore multiplying grammes of NH_3 as hydroxide, by 10, and dividing by 0.96, will give cubic centimeters of 10 per cent. ammonium hydroxide per 100 Cc.

The method of assay, as given in this paper, has given satisfaction and has been of great help to the author in the valuation of aromatic spirit of ammonia samples.—*Amer. Journ. Pharm.*, Jan., 1912, 7-14.

Aromatic Spirit of Ammonia, B. P.—Composition.—In view of the attention being devoted to aromatic spirit of ammonia by public analysts, H. B. Jensen endeavors to define what its real composition should be—that is as regards the relative proportions of the ammonium compounds, on which subject the pharmacopœial requirements and tests are vague. A simple calculation will show that a loss of ammonia in manufacture is allowed for by the titration figure of 25.5 Cc., but it can scarcely be held from the wording of

the test that a somewhat stronger preparation is excluded; in fact, the variability of the density alone of the product must permit some such margin with a volumetric test, and a full strength preparation is as a fact recognized by public analysts. There is also the further difficulty of assigning the total loss to two distinct ammonium compounds. The rather subtle analytical standards involved will become clearer by consulting the following table, which also forms a summary of the determinations subsequently described by the author:

—	No. 1	No. 2	No. 3	No. 4
B. P. Ammonium Carbonate.....	2.856%	2.71%	2.856%	2.446%
Free Ammonia.....	1.654%	1.57%	1.526%	1.654%
Ammon. Carb. Volumetric Equivalent N/1 Acid.....	9.34 Cc.	8.96 Cc.	9.43 Cc.	8.08 Cc.
Free Ammonia Volumetric Equivalent N/1 Acid.....	17.42 Cc.	16.54 Cc.	16.07 Cc.	17.42 Cc.
Theoretical Equivalent of 10% Barium Chloride if 1 Bicarbonate to 1 Carbamate 100% pure per 20 Cc.....	15.84 Cc.	15.04 Cc.	15.84 Cc.	13.58 Cc.
Theoretical Equivalent of 10% Barium Chloride deduced from an actual loss on a B. P. Ammon. Carb.	15.39 Cc.	14.61 Cc.	15.39 Cc.	13.19 Cc.
Highest Possible Indicated CO ₂ Volume from 5 Cc. Sp. Amm. Co.—using such Amm. Carb.—reduced to N. T. P.....	33.75 Cc.	31.8 Cc.	33.75 Cc.	28.5 Cc.
Initial Nitrometer reading at 15° and 760 Mm. from 5 Cc. Sp. Ammon. Co.—with such average Amm. Carb.....	32.1 Cc.	30.2 Cc.	32.1 Cc.	26.9 Cc.
Theoretical Volume of CO ₂ at N. T. P. from 5 Cc. average S. G. calculated from real weight of CO ₂ present in the Amm. Carb.)	35.2 Cc.	33.3 Cc.	35.2 Cc.	30.0 Cc.

No. 1 represents a preparation in which no loss of ammonia has taken place—the extreme case, where such precautions have been observed to give such a result.

No. 2 represents a preparation with the loss in manufacture allowed by the B. P. assigned proportionally between the two compounds of ammonia, the fairest standard, and possibly the most accurate one, in view of the ultimate state of combination of the whole of the ammonia, being substantially normal carbonate.

No. 3 is a case in which all the loss in manufacture has been assigned as due solely to the free ammonia, a possibility confirmed to some extent from the arithmetic of the barium chloride test, and the fact that this is used as a limit test.

No. 4 is the final extreme case in which all the permitted loss is allotted to the ammonium carbonate, the indefinite official characters of which make this a possibility not to be excluded, more especially as the deficiencies of the barium test now prevent this being accepted as reliable evidence of the intentions of the compilers.

As the result of his experiments, the author considers it expedient to substitute for manufacturing control and general analytical purposes an accurate assay of the ammonium carbonate present in the spirit, and he proposes a volumetric method, which he describes in detail, and which he considers to be sufficiently accurate to satisfy all legitimate demands.—Pharm. Journ. and Pharmacist, Jan. 6, 1912, 4-5.

Spiritus Ammoniac Aromaticus—Storage.—Dr. Linwood A. Brown concludes from a study of the storage of this preparation extending from March to June, 1911, that it should be kept in glass or rubber-stoppered bottles, at a temperature not exceeding 15° C. or 60° F. and not at so low a temperature that the ammonia salt shall be deposited.—Proc. Kentucky Pharm. Assoc., 1912, pp. 136-139. (E. C. M.)

Spirit of Camphor—New Modus Operandi.—Th. Pieper places a large chemical funnel on a 10 kilo bottle, making an air-tight connection with a rubber stopper. The pointed end of the funnel just touches the alcohol in the bottle. The camphor, in pieces, is put in the funnel and sufficient alcohol is added to cover same. Circulatory displacement begins and it is possible to dissolve 3 kilos of camphor in 6 kilos of alcohol in about five hours without any trouble whatsoever. In order to prevent any "creeping" of the spirit of camphor, it is best to apply a little petrolatum around the edge of the funnel. The concentrated solution of camphor can be diluted for the pharmacopœial spirit of camphor.—Zbl. Pharm., 1912, No. 21. (O. R.)

Spirit of Camphor—Quantitative Assay.—H. Batasille recommends the following method for assaying spirit of camphor, which is based on the insolubility (resp. precipitability) of camphor in water: To 10 Cc. of the spirit of camphor in a flask, water is slowly added from a burette, drop by drop, until the precipitate produced no longer disappears on shaking. A spirit made with 90° alcohol, containing 10 per cent. of camphor, requires 9 Cc. of distilled water under these conditions; the number of cubic centimeters required being denominated by the author the "precipitation number." Samples of spirit of camphor of variable composition cannot possess the same specific gravity and also the same precipitation number.

So, for example, if the spirit of camphor has the specific gravity 0.845 and shows a precipitation number of 10.5, it contains about 6 per cent. of camphor in alcohol of about 88°. On this basis the author has constructed the following table:

Camphor Content, per cent.	90° Alcohol, spec. grav.	Precipitation Number.
0	831.0	..
1	832.2	..
2	833.9	..
3	835.0	about 20
4	836.2	16
5	837.5	18.7 (15.7 ? Rep.)
6	838.9	12.8
7	840.1	11.
8	841.8	10.
9	843.0	9.4
10	844.4	9
11	845.7	8.8
12	847.0	8.0
13	848.2	7.2
14	849.4	6.9
15	850.6	6.6

—Pharm. Ztg. lvii (1912), No. 63, 634; from Bull. des Sciences Pharmacol., 1912, No. 7.

Spirit of Camphor—Method of Assay.—A. T. Collins suggests that spirit of camphor may be accurately assayed by the following method:

Polarize in a 200 Mm. tube, making correction for temperature, $\frac{1}{2}$ Mm. for each degree C., adding if above 20° C., deducting if below.

Place 50 Cc. or more in evaporating dish and evaporate to dryness on water bath, stirring with glass rod at end to get camphor dry as possible. When quite dry place on watch glass, cover with small funnel and carefully sublime.

Dissolve 2.5 Gms. of the sublimed camphor in sufficient alcohol to make 25 Cc. and polarize as at first. This is called the "control."

The percentage is found by dividing the minutes of rotation of the control into the original reading, and then multiplying by 10.—Journ. Ind. and Eng. Chem., July, 1912, vol. 4, p. 514. (L. A. B.)

Eau de Cologne—Origin, Manufacture and Aging.—Dr. Hermann Prinz thinks the first manufacturer of this preparation was Johann Maria Farina, an Italian, who started the manufacture of cologne water, in Cologne on the Rhine, in 1709. The same firm still carries

on business, and by general consent of the mercantile lay world, the bottles carrying its label are looked upon as containing "genuine" Eau de Cologne. The genuine article is acid in reaction, but alkaline and neutral Eau de Colognes are found in the market. Storing and aging vessels should be of glass or well-seasoned, oak wood, spirit barrels. The alcohol must be free from fusel oil and a method is given for its detection. Only the best quality of essential oils are to be used and only distilled aromatic waters. The finished product should be left undisturbed for a year at least. Four formulas are given.—Nat. Drugg., January, 1912, 9-11. (C. M. S.)

SUCCI.

Fruit Juices—Utilization of Garden Fruits to Make Palatable Wines.—P. Carles directs attention to the statement that during ordinary seasons in France 20,000,000 kilos of cherries are absolutely wasted, and in good years as much as 50,000,000 kilos. This loss is mainly due to difficulties of transport between rural districts and towns. If this fruit could be fermented, a wholesome beverage might be obtained. The reason that palatable "wines" cannot be made from cherries and other garden fruits is stated to be due to their deficiency in tartaric acid. The author says that if this is added in such proportion as to bring the total acidity of the juice to the equivalent of 7 to 9 Gm. of tartaric acid to the liter, fermentation will proceed normally, regularly, and completely, as in the case of wine made from grapes. All that is necessary is a preliminary titration of the fruit juice and the addition of the requisite amount of acid. As fermentation proceeds, the potash salts present in the juice, having combined with the acid to form potassium acid tartrate, are precipitated precisely as occurs when grape juice is fermented.—Pharm. Journ. and Pharmacist, Sept. 7, 1912, 319; from Repert. de Pharm., 24 (1912), 241.

SUPPOSITORIA.

Bismolan Suppositories, recommended for the treatment of hæmorrhoids, are stated to contain bismuth oxy-chloride and a trivial quantity of adrenalin in a base composed chiefly of lanolin. These suppositories are coated with a special preparation which fuses rapidly after insertion.—Pharm. Ztg., lvii (1912), No. 28, 282.

Cacao Suppositories—Addition of Wax to Promote the Incorporation of Aqueous Solutions.—P. van der Wielen and J. Van Riel find that by the addition of 2.5 per cent. wax to cacao butter a base is obtained for suppositories which will permit the incorporation of aqueous solutions, glycerin or ichthyol up to the amount of

1 Gm. to a 3 Gm. suppository. They find that by the addition of wax the melting point of the cacao is reduced from the normal (32.5°) until the addition amounts to 63.4 per cent., at which it has the melting point of 31.0 ; by the further addition it then rises, reaching the body temperature (37.0°) when 6.05 per cent. of wax has been added. The authors furthermore find that the addition of 2.5 per cent. of wax serves well also for the incorporation of iodoform when the suppositories are made by the melting-method. If, for example, 300 Mgm. of iodoform is melted with 3 Gm. of cacao butter, the iodoform is completely dissolved at the melting temperature, but on cooling is again separated, forming *large* crystals before the fat completely solidifies. By adding 2.5 per cent. wax, however, the crystals formed are very much smaller. The addition of wax presents the further advantage of obviating the use of hollow suppositories for the reception of solutions of potent medicaments.—Pharm. Ztg. lvii (1912), No. 55, 554; from Pharm. Weekbl., 1912, No. 25.

Glycerin-Tannin Ovules—Formula.—M. Bruzzzone gives the following formula for preparing ovules of glycerin and tannin: Dissolve 4.0 tannin and 4.0 borax in 90.0 glycerin, on a water bath, and gradually add, with constant stirring and continuance of a gentle heat, a previously prepared solution of 12.0 ichthyocolla in 40.0 distilled water. The mixture is then poured into well-chilled molds of suitable size and shape. Prepared in this way, the ovules will keep for a long time.—Pharm. Ztg. lvii (1912), No. 11, 104; from Bull. Chim. farm.

SYRUP.

Syrup. Ammonii Hypophosphitis.—In a paper entitled "Some Criticism and Comments on the Proposed N. F. Formulas," Dr. P. E. Hommell says that the addition of compound spirit of vanillin to this syrup is apt to make it sickening to susceptible patients and that it is a very acceptable preparation without this addition, and further remarks that unless drugs are very bitter, nauseous or acrid, flavoring, sweetening or coloring to the degree found in the N. F. preparations are entirely unnecessary.—Proc. N. J. Pharm. Assoc., 1912, pp. 90-96. (E. C. M.)

Syrup of Bitter Orange Peel, Fr. Ph.—Artificial Coloration.—While investigating the cause of the liability of syrup of bitter orange peel to gelatinize when made by the official formula of the French pharmacopœia, which he attributes to pectinous matter introduced by the maceration of the peel in tepid water after the preliminary maceration in alcohol, P. Malaguin was struck by dif-

ference in color of commercial specimens of the syrup. Some of these, exceptionally bright in tint, were found to be alkaline, due to free ammonia. These gave markedly ammoniacal distillates. Evidently they had been treated with a little ammonia to "improve" the color, or else were made from fluidextracts to which the alkali had been added for the same reason—reprehensible in either case.—Pharm. Journ. and Pharmacist, Oct. 26, 1912, 519; from Journ. de Pharm. et Chim., 1912, 6, 349.

Syrup of Calcium Lactophosphate—Improved Formula.—In order to avoid the difficulties encountered, owing to the insolubility of calcium phosphate when making syrup of calcium lactophosphate, de Saint-Sevrin, otherwise following the process of the formula given in the Supplement to the French Pharmacopœia of 1884, proceeds as follows: To 4.1 Gm. quick lime 50 Gm. distilled water are added and when the lime is completely slacked it is mixed with 80 Gm. coarsely powdered sugar. A dense solution of calcium saccharate results, to which, after an hour, 700 Gm. of sugar syrup and 14.0 Gm. of lactic acid are added, followed by 20.5 Gm. of phosphoric acid. The syrup is then strained through flannel, and sufficient sugar syrup is added to make 1 Kgm. of syrup, which is aromatized finally by the addition of 10 drops essence of lemon.—Pharm. Ztg. lvii (1912), No. 45, 453; from Répert. de Pharm., 1912, No. 5.

Syrupus Calcii Lactophosphatis—Improved Manipulation.—Wilbur F. Horn says that the following method of procedure proves more satisfactory than that of the Pharmacopœia: Mix the lactic and phosphoric acids with 100 Cc. of water in a capacious vessel, add the precipitated calcium carbonate in small portions to the mixture, agitating after each addition, until it is entirely dissolved and effervescence has ceased, add 100 Cc. of water, filter through a plain filter, rinsing the container and washing the filter with 100 Cc. of water; add the orange flower water, then the sugar, agitate until solution is effected, strain through absorbent cotton; add enough water through the cotton to make the measure 1000 Cc.—Proc. Penn. Pharm. Assoc., 1912, p. 150. (E. C. M.)

Syrupus Ferri Iodidi—Improved Process of Preparation.—O. J. Cloughly suggests the following as an improved process for syrup of iodidi of iron:

Iron wire (bright and cut in small pieces)	12.5 Gm.
Iodine	41.5 Gm.
Citric acid	4 Gm.
Sugar	600 Gm.
Solution potassium hydroxid.	50 Cc.
Distilled water, q. s.	

Place the iron wire in the solution potassium hydroxid in a proper container; shake it well for about ten minutes, decant and wash the iron thoroughly with distilled water; decant and repeat the operation until the iron is entirely free from the slightest trace of the hydroxid, then proceed with the directions of the U. S. P., replacing the dilute hypophosphorus acid with four grams of citric acid.

The cleansing of the iron wire with the hydroxid solution leaves the iron free from oxid or any other substance that might cause the finished product to turn dark. The hypophosphorous acid forms iron hypophosphate, which easily turns dark; the citric acid forms the citrate of iron, which gives the finished product the required green color.—Proc. Missouri Pharm. Assoc., 1912, pp. 133, 134. (E. C. M.)

Aromatic Syrup of Quinine.—Dr. R. E. Hommell criticizes the enormous waste of quinine as administered in pill or tablet form, and recommends the following as a most eligible preparation for its administration after an experience of many years with it in his own practice:

Quinine sulphate.....	1 drachm.
Hydrobromic acid dilute.....	q. s. to dissolve.
Tinct. cardamom. co.	
Anise water of each.....	4 fl. drams.
Simple syrup to make.....	4 fl. ounces.

The use of hydrobromic acid tends to overcome some of the untoward action of the quinine, such as headache, giddiness and tinnitus aurium, with not infrequent impairment of hearing and of sight, and he has never observed, following its use, any cutaneous eruptions which are often the sequelæ of the administration of quinine in concentrated form.—Proc. N. J. Pharm. Assoc., 1912, pp. 96-97. (E. C. M.)

Syrup of Raspberry—Amyl-Alcohol Test for Tar Colors.—E. Schroedter's experience supports the statement that the G. P. V test for the absence of tar colors in syrup of raspberry is liable to be misleading, since amylalcohol is apt to take up the natural coloring matter of the fruit, particularly when the berries have ripened well and have a deep red color. It is true that the color so imparted to the alcohol is comparatively faint, pale rose-red, but its occurrence may be misinterpreted unless it is distinctly understood that the amylalcohol separating slowly after vigorous shaking with the syrup must be decidedly red to indicate the presence of a tar-pigment. A simple and reliable test for the latter consists in dyeing a woolen

thread, previously saturated with sodium acetate solution, in the syrup.—Pharm. Ztg. lvii (1912), No. 72, 728.

Sirop de Raifort Composé—A Valuable Antiscorbutic.—Professor Buttin deplores the abandonment of old remedies for modern synthetics and thinks the old-time antiscorbutics were of real service in scrofulous affections. He gives his personal experiences in making compound syrup of horse-radish from the fresh root.—Schweiz. Wschr. f. Chem. u. Pharm. 1 (1912), No. 14, 200. (H. V. A.)

TABLETTÆ.

Tablets—Their Manufacture by the Pharmacist.—Magister Jos. Hoyer, apotheker in St. Valentin, deplores the fact that the pharmacist is flooded with tablets prepared by factories and suggests a remedy, namely, the manufacture of these tablets by the pharmacist himself. From his own practical experience the author writes a series of articles on the technique of tablet making.—Ph. Post, 1912, No. 2, 4, 6, 10, 12. (O. R.)

Asafetida Tablets—Assay.—L. Henry Bernegan and George E. E. We recommend the following process for assay of asafetida tablets: A number of tablets corresponding to about 10 grains of asafetida are powdered and extracted twice with chloroform. The residue, insoluble in chloroform, is moistened with 5 per cent. hydrochloric acid, some sand is added, and the mixture is evaporated to dryness on a steam-bath. The residue is then extracted three or four times with hot chloroform, the chloroform extracts added to the first two extractions and the united chloroformic extracts evaporated to dryness on a water-bath in a tared flask. The resultant weight multiplied by two, represents about 98 per cent. of the equivalent of U. S. P. asafetida in the tablets taken.—Proc. Penn. Pharm. Assoc., 1912, p. 305. (E. C. M.)

Sublimate Pastilles, G. P.—Correction of Assay Process.—E. Brieger observes that the direction of the G. P. V to add "3 Cc. formaldehyde solution and 10 Cc. of water," in the assay process for sublimate pastilles, should properly read, "3 Cc. formaldehyde solution, *diluted* with 10 Cc. water." If the undiluted formaldehyde solution is added to the reacting mixture, the mercury is not precipitated in the finely divided condition necessary for subsequent solution, but if it is used diluted previous to addition, the precipitate is so finely divided as to insure its subsequent solution in the iodine solution directed.—Arch. d. Pharm., 250 (1912), No. 1.

TINCTURÆ.

Concentrated Tinctures—Improved Method of Preparation.—An examination of concentrated tinctures of the market leads J. Haycock to the opinion that the necessary care is not given in the selection of the drug and the preparation of the finished product. It would be foolish to say that when diluted they represent faithfully the tinctures of the B. P. This is probably due to faulty extraction, wherefore the author suggests percolating the drug with industrial methylated spirit of suitable alcoholic strength until exhausted, then distilling off the spirit, and dissolving the residual soft extract in the required quantity of alcohol. The method works well with concentrated tinctures in which a relatively small amount of menstruum would be available, but it is obvious that it is not of much value where it is desired to retain volatile ingredients. Concentrated tinctures* prepared by this method were examined, the various drugs being found to yield their full alkaloidal values as determined by previous assay. No traces of methyl alcohol were evident in the finished tinctures. Standards are suggested by the author. In certain cases where time prevented the preparation of a sufficient number of samples from authentic materials to suggest a reasonable standard the analytical results obtained for ordinary tinctures have been multiplied by the concentration. Where no method exists for the determination of the active principles the percentage of the total solids has been stated. The results are shown in a table, with detailed annotation, comprising a large number of tinctures prepared by the proposed method.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1912, 535-542.

Potent Tinctures—Keeping Properties Determined by Physiological Tests.—In a paper read before the British Pharmaceutical Conference, Dr. Alexander Goodall, maintaining that it is unjustifiable to dispense such potent tinctures as tincture of digitalis, strophanthus, or squills, which have not been tested, describes and gives the results of the determination of the potency and keeping qualities of a large number of each of the tinctures during several years by physiological tests. These tests were carried out upon male frogs, usually about 20 grammes in weight, the potency accepted as normal being the amount of standard tincture required to kill a frog of 20 grammes in four hours. The results are shown in the following summary:

Tincture of Digitalis.—Of twenty-three samples made by manufacturers of repute, eleven showed a departure from the normal

potency, six being below the average and five above the average of potency. As regards keeping properties, the tincture is not reliable after a year.

Tincture of Strophanthus.—Four of twenty-one samples showed a deviation from the normal potency, two above and two below the adopted standard. Similarly fourteen samples of tincture prepared according to the B. P., 1885, showed three deviations above and three below the normal potency. The official tinctures retained their full activity for at least three years. Those of the B. P., 1885, only two years.

Tincture of Squill.—Of ten samples examined, only five conformed to the standard, the other five possessing a potency above the normal standard. The tincture deteriorates after two years.

The author emphasizes that a very real danger may arise from excessive potency of these tinctures, and insists that only those which have been recently prepared and submitted to physiological tests should be dispensed.—*Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy)*, 1912, 437-442.

Tincturæ Vinosæ—Proposition to Substitute Them for the Alcoholic Tinctures.—While in this country the tendency is to get away from the use of wine for the extraction of vegetable drugs, a writer in *Pharm. Ztg.*, over the signature "C. M." advocates the introduction of vinous tinctures to replace the tinctures now made with alcohol of varying strength and dilutions. Although the proposition is supported by the claim that the official *Tinctura Rhei Vinosa* (G. P.) has maintained and even increased its popularity, it is apparent that an important consideration is the greater cost of tinctures made with alcohol, and on this ground the proposition might safely be ignored. But it is stated in a foot note by the editor that the proposition will doubtless receive favorable consideration, and the proposition therefore becomes a debatable question.—*Pharm. Ztg.*, lvii (1912), No. 54, 544.

Referring to the above suggestion, another correspondent (*R*) points out that, however desirable, the number of tinctures which can be advantageously prepared with a vinous menstruum are comparatively few, since drugs containing alkaloids, or oils or resins as active ingredients must, as heretofore, be prepared with alcohol to insure complete extraction and preservation.—*Ibid.*, No. 55, 556.

A third correspondent (*D*) referring to the same proposition, also expresses the opinion that tinctures prepared with wine must of necessity be restricted in number, owing to the impracticability

to completely extract and represent the drug and the difficulty of holding the extracted matter in solution. He suggests that possibly satisfactory preparations may be obtained by preparing alcoholic extracts and dissolving these in the proper proportions in strong Spanish wine; but even here many drugs would be excluded, among others, asafetida, gallanum, myrrh, tolu, iodine, vanilla, catechu, which must as heretofore be prepared with alcohol.—*Ibid.*, No. 57, 575.

Tinctures—Preparation with Sherry Wine.—Actuated by the proposition to substitute sherry wine for the alcoholic menstrua officially employed for preparing tinctures, when this is practicable, Fr. Bodinus has made a number of tinctures with sherry wine and with the prescribed (G. P. V.) alcoholic menstruum, which on examination gave the following results:

	Residue of Evaporation		Alkaloid Content	
	G. P. Process	Made with Sherry	G. P. Process	Made with Sherry
Tinct. Calami	3.06%	3.04%
“ Gentianæ	6.9 %	6.82%
“ Valerianæ	3.48%	3.24%
“ Ipecacuanhæ	1.16%	1.22%	0.202%	0.198%
“ Strychni (=Nux Vomica)....	1. %	1.02%	0.249%	0.240%

The author concludes that these results speak in favor of the proposed modification of preparing tinctures, and that sherry wine very efficiently replaces the alcoholic menstrua in the preparations embraced by his experiments, which are practically identical as obtained by either method, in so far as their active constituents are concerned. As regards the manipulation with wine, the tinctures are easily and expeditiously filtered if they are allowed to stand three days after their expression from the dregs before filtering them, and show no disposition to form deposits.—*Pharm. Ztg.*, lvii (1912), No. 78, 786.

Tincture of Aloes—Tests of Identity.—H. Hérissé proposes the following description for the French Codex: Brown or greenish-brown liquid with an aloe odor and a very bitter taste. When mixed with 2 volumes H₂O a heavy precipitate is produced. Mix 1 Cc. of tincture with 5 Cc. H₂O, add 10 Cc. ether and set aside. Separate the ethereal layer, add 3 Cc. H₂O and 2 drops ammonia water and the aqueous layer will be colored cherry red.—*Journ. Ph. et Ch.*, 1912, 393. (O. R.)

Tincture of Arnica—Cases of Poisoning.—Cases of poisoning with tincture of arnica are not very common. One such has been recorded by Drouet, that of a woman who had taken two table-spoonfuls of the tincture to bring on the catamenia. This dose produced intense pain in the epigastric region, with a burning sensation in the œsophagus. After four days' treatment in hospital the case was discharged, cured. The use of tincture of arnica as a remedy for amenorrhœa is stated to be prevalent about La Rochelle. It is known that large doses of arnica may occasion vomiting and even hemorrhage; also intense nervous excitement, sometimes with a fatal termination.—Pharm. Journ. and Pharmacist, April 13, 1912, 485; from *Nouv. Remèdes*, 29 (1912), 96.

Tinctura Cardamomi Composita—Improved Formula—John K. Thum finds that the present pharmacopœial method for the preparation of compound tincture of cardamom, which is one of maceration and filtration, while avoiding the troublesome percolation involved in the older process, due to the difficulty of percolating the cinnamon bark, has no advantage over the older on the score of permanent clarity. Filtration must be resorted to quite frequently to free it of a pectinous constituent derived from the cinnamon bark. He advises therefore to substitute 2.5 Cc. of spirit of cinnamon for the 25 Gm. of cinnamon bark directed, and adding this, together with the glycerin to a tincture obtained by percolation of the powdered cardamom, caraway and cochineal with sufficient diluted alcohol to make the required volume.—*Amer. Jour. Pharm.*, July, 1912, 298-299.

Tincture of Iodine—Liability to Change and Expedients for its Prevention.—Th. Budde, staff-apothecary in the German War Department, finds that under ordinary conditions there is a loss of iodine as such in the tincture of iodine of the G. P. amounting to as much as 20 per cent. in the course of nine months, resulting in the formation of hydrogen iodide, acetic ether and aldehyde. This change is particularly rapid during the first eight days, but is materially retarded by the addition of 3.5 Gm. of KI or NaI for 10 Gm. of iodine. Nevertheless, the changes during six months are so great that a tincture should not be dispensed after it has been prepared that long. Moreover, it should be preserved in glass-stoppered bottles, contained in a tin can lined with asbestos on the inner side, the asbestos containing an iodine-combining substance. It has been a problem of the military sanitary authorities to devise means for supplying this tincture in a practically unchanged condition. This has been solved by supplying sealed vials, each contain-

ing 10 Gm. of iodine and 3.5 Gm. of potassium iodide, ten of such vials being enclosed in a cardboard box. When the tincture is needed, the contents of a vial are dissolved in 90 Gm. of alcohol, with instruction not to use the tincture so prepared after it is six months old.—Pharm. Ztg., lvii (1912), No. 18, 176.

Tincture of Iodine—Improved Method.—E. A. Geyer believes that many samples of tincture of iodine found to be below pharmacopœia strength are so because of carelessness in preparing same and that the iodine and potassium iodide are not entirely dissolved. He recommends placing the solids on a cotton diaphragm in a glass funnel and percolating with the alcohol. This method is claimed to completely and quickly dissolve the solids.—Bull. Pharm., April, 1912, 167. (C. M. S.)

Tincture of Iodine—Effect of Glass on its Composition.—Suspecting that the decomposition of tincture of iodine is in some degree influenced by the composition of the glass container, Drosté transferred two portions of 50 Cc. of a freshly prepared tincture into an ordinary medicine bottle and into a thin-walled flask of Jena glass, respectively, preserving them during six weeks under identical conditions. On titrating them, 10 Cc. of the tincture in the medicine bottle required 3 Cc. less of 1/10 N-thiosulphate solution than did 10 Cc. of the tincture preserved in the Jena glass flask—a difference corresponding to 0.0379 Gm. of iodine ($I=126.5$), or about 3.7 per cent.—Pharm. Ztg., lvii (1912), No. 17, 166.

Tincture of Myrrh—Disadvantage of Prolonged Maceration.—In order to ascertain whether the modern tendency to reduce the period of maceration from seven days to three days is justified in the preparation of tinctures or solutions of resins and gum resins, C. J. Reichardt has made a series of experiments which demonstrate that prolonged maceration of myrrh in ethyl or methyl alcohol is a disadvantage. He finds that by macerating the myrrh for three days in 96 per cent. alcohol, the product fully represents the drug, whereas by prolonging the maceration it is changed in color as well as in the amount of residue of evaporation.—Pharm. Ztg., lvii (1912), No. 67, 678.

Tinctura Opii Deodorati—Deodorization With Paraffin.—O. J. Cloughly suggests the use of paraffin in making deodorized tincture of opium, to replace the benzin of the official process:

Granulated opium	100 Gm.
Paraffin	q. s.
Alcohol	200 Cc.
Water	q. s.

Heat 500 Cc. of water to boiling and pour it on the granulated opium contained in a suitable vessel, stirring the mixture frequently during twenty-four hours. Then transfer the mixture to a percolator, return the first percolate until it runs through clear and when the liquid ceases to drop, continue the percolation with water until the opium is exhausted; concentrate the percolation by evaporation over a water bath until it measures 150 Cc. Take about 60 grams of paraffin and melt to a liquid and add to the opium while it is still hot and beat the two together for about five minutes, then set aside to cool. When cool, break a small hole through the paraffin, which will rise to the top, and drain off the opium, which will be completely deodorized. Mix the deodorized liquor so obtained with 600 Cc. of water, filter and add the alcohol; wash the filter with sufficient water to make 1000 Cc.—Proc. Missouri Pharm. Assoc., 1912, p. 132. (E. C. M.)

Tinctura Opii Deodorati—*Preparation from Deodorized Opium*.—William K. Ilhardt discusses the preparation of deodorized tincture of opium from deodorized opium and suggests the following process for preparing the same:

Deodorized granular opium, (12-12½%)	100 Gm.
Alcohol	200 Cc.
Water, q. s.	1000 Cc.

Heat 500 Cc. of water to boiling, pour it on the granulated opium contained in a suitable vessel, stirring occasionally during 24 hours. Then transfer the mixture to a percolator, return the first portion of the percolate until it runs through clear, and continue the percolation until the opium is exhausted. Reserve the first 650 Cc. of percolate, add to this the alcohol, and evaporate the remainder on a water bath until it measures 100 Cc. Allow it to cool and mix with the reserved portion; filter this mixture, rinse the dish with water and pour on the filter, using sufficient to make 1000 Cc. of tincture.

The alcohol is added to the reserved portion to preserve it, since it is not evaporated as in the official process.

One advantage of the proposed *technique* is that the bulk of the extract and the alkaloids are not subjected to prolonged heat.—Proc. Missouri Pharm. Assoc., 1912, pp. 112-3. (E. C. M.)

UNGUENTA.

Ointments of the B. P.—Suggested Changes.—E. W. Lucas makes some practical suggestions regarding the direction in which the ointments of the B. P. require modification and improvement. He says the collateral criticisms of numerous writers, both medical and pharmaceutical, seem to indicate that but few of the official ointments meet the requirements for which they were originally desired, but the suggestions for improvement are so exceedingly diverse that it is a practical impossibility for them all to be reconciled. The most that can be done is to formulate standards not too hard for pharmacists to maintain and sufficiently satisfying for the majority of medical practitioners.

The bases of the pharmacopœial ointments are somewhat and possibly unnecessarily varied, and their number ought to be capable of reduction. As far as can be judged from medical criticism, only two principal bases are required—a “protective basis,” of which paraffin ointment may be taken as a type, and an “emollient basis,” such as lard—with explicit directions for modifying the plasticity so as to suit varying conditions of temperature, etc.

The author’s paper covers the whole gamut of official ointments, but for most of them he has no changes in formula to propose. Omitting the details accompanying the modifications suggested, the proposed changes appear in the following formulas:

Protective Basis.—This is “Unguentum Paraffini” having the following formula, suitable for a standard temperature of 15° C.:

Hard paraffin (m. p. 54°-57° C.)	27
Soft paraffin (m. p. 44°-46° C.)	70
Beeswax	3

If the ingredients after melting and straining are allowed to cool without stirring, a somewhat translucent plastic basis results, which may be fairly easily rubbed down in a mortar or on a slab. If the mixture is gently stirred a whiter and more opaque basis results.

Emollient Basis.—For this the name “Unguentum Emolliens” is proposed, but the formula can possibly be improved and a more elegant product obtained:

Lard	40
Wool-fat	40
Paraffin ointment	20

Unguentum Aquæ Rosæ.—The following formula is suggested:

White beeswax.....	18
Almond oil.....	61
Borax	1
Rose-water	20
Oil of rose.....	0.1

Melt the wax with the almond oil, strain and add gradually, with constant stirring, the rose-water in which the borax has been previously dissolved. When cool add the oil of rose.

Unguentum Belladonnæ.—

Liquid extract of belladonna.....	80
Benzoated lard.....	60
Wool-fat	20

Melt the fats, and allow to cool. Reduce the liquid extract to 20 by evaporation at a temperature not to exceed 95° C., and incorporate with the mixed fats.

"*Unguentum Cantharidini*" should replace the present official title, *Unguentum Cantharides*, since Greenish's modification has been adopted to fill its place. This is as follows:

Cantharidin	0.20
Yellow beeswax.....	
Wool-fat, in equal proportion to make.....	100.
Chloroform	q. s.

Dissolve the cantharidin in sufficient chloroform by the aid of heat, and add to the other ingredients previously melted together; stir until cold.

Unguentum Capsici is advised to be changed, thus:

Capsicum oleo-resin.....	10.
Lard	10.
Hard paraffin.....	10.
Soft paraffin.....	70.

Unguentum Conii, if retained, is well made by the following formula:

Conium juice.....	200.
Boric acid.....	2.
Wool-fat	50
Soft paraffin.....	5.

Add the boric acid to the conium juice and evaporate at a temperature below 60° C., until reduced to 43 (45? Rep.); gradually incorporate with the other ingredients.

Unguentum Gallæ cum Opio.—A radical change is proposed by the following formula:

Tannic acid.....	5.
90 per cent. alcohol.....	3.
Morphine	0.75
Oleic acid	2.25
Wool-fat	40.
Soft paraffin.....	49.

Dissolve the morphine in the oleic acid by means of heat, and add the mixed basis; afterwards incorporate the tannic acid dissolved in the alcohol.

Unguentum Glycerini Plumbi Subacetatis.—Guyer and Ewing's formula, omitting glycerin, is an excellent suggestion:

Strong lead subacetatis solution.....	12.5
Wool-fat	25.
Hard paraffin.....	12.5
Soft paraffin.....	50.

Unguentum Hamamelidis, prepared by the following formula, is a great improvement over the one now official:

Liquid extract of hamamelis.....	10.
Wool-fat	60.
Soft paraffin.....	30.

Unguentum Hydrargyri Ammoniati.—To make it more useful in impetigo and for destroying pedunculi, Wild suggests a return to lard and a reduction to 5 per cent., as follows:

Ammoniated mercury.....	5
Benzoinated lard.....	95

Unguentum Picis Liquidum, reported as too thick and sticky, is improved by the following formula:

Tar	70
Lard	5
Beeswax	25

Unguentum Plumbi Acetatis, if retained, is better prepared by the following formula:

Lead acetate.....	4
Water	9
Paraffin ointment.....	87

The author's criticisms and strictures on the ointments for which no modified formula is suggested are quite interesting and should be consulted in the original, in *Chem. & Drugg.*, Feb. 17, 1912, 262-264.

Ointment Bases—Modern Improvements.—A contributor to the *Pharm. Ztg.* critically reviews the different ointment bases that has been suggested to meet the requirements of modern therapy, and

arrives at the conclusion that the soft medicinal soaps have proven most effective for this purpose. They practically fulfill all demands that can be made upon ointment bases, both as regards medicinal effectiveness and pharmaceutical technic, by their complete absorbent qualities, their solubility in water, their stability (non-rancidity), and their mixibility with fats or water. Moreover, by the improved methods of their preparation, it has become possible to produce soaps of such mildness, that their application to open wounds is absolutely painless.—Pharm. Ztg., lvii (1912), No. 48, 483.

Ointments—Their Bactericidal Effect.—As early as 1895 did Dr. E. Breslauer report on this subject. Dr. Robert Koch in 1881 proved that phenol dissolved in alcohol or oil does *not* possess any disinfectant properties. The author, Dr. Hugo Kuehl, states that the same is true of carbolated petrolatum. He refers to the toxicity of mercury—silver—and lead salts as based upon the dissociation theory of Arrhenius. Breslauer found that hydrous wool-fat (lanolin) and cold cream (Ung. leniens) are superior to petrolatum and anhydrous wool-fat as ointment bases as carriers of disinfectants. The explanation is that ointment bases containing water are better carriers for antiseptics, because they are more readily absorbed.—Ph. Zhalle, 1912, No. 11, 273-276. (O. R.)

Ointment Applicator and Distributor.—Daniel W. Layman describes and illustrates a compressed-air ointment applicator and distributor that is especially designed for the application of ointments to the nasal mucosa.—J. Am. Med. Assoc., 1912, v. 59, p. 2313. (M. I. W.)

Unguentum Adhæsivum ("Klebesalbe").—Useful Formula.—Dr. Dreuw highly recommends the following formula for an adhesive salve, both on account of its composition and consistency, which he has found extremely useful for the treatment of chronic infiltrations of the skin, whether of exzematic or psoriatic nature:

R	Acid. salicyl.....	10.0
	Pyrogallol	20.0
	Liq. carbon. deterg.....	20.0
	Zinc. oxydat.....	20.0
	Sapon, virid	25.0
	Adip. lan. anhydric.....	25.0

M. D. S. Ung. adhaesi.

The ointment has a white-gray color, but soon acquires a black color on the surface, while the interior retains its grey color. Its adhesive qualities, however, are remarkable, and superior to that

of any other ointment. Consequently it adheres persistently to the skin, a desideratum particularly in the treatment of eczemas.—*Pharm. Ztg.*, lvii (1912), No. 3, 27; from *D. Med. Wschrft.*

Ointment of Colloidal Silver.—The proper preparation of *Unguentum Argenti Colloidalis* of the new German Pharmacopœia has caused a great deal of discussion. R. Richter states that it is an entirely wrong procedure to pulverize the colloidal silver and then mix it with the ointment. It is highly important to add the same amount of distilled water as there is colloidal silver and leave the mixture standing in a mortar until it is spongy. The mixture is then thoroughly triturated and the ointment base added.—*Ph. Zhalle.*, 1912, 46, 1305. (O. R.)

Iodine Ointment, B. P.—Function of Glycerin and Potassium Iodide.—In the evolution of the formula for iodine ointment in successive editions of the British Pharmacopœia, the alcohol used to dissolve the potassium iodide was eventually replaced by glycerin and the iodine was increased from about 3.2 per cent, to 4 per cent. The addition of potassium iodide, as is well known, was made for the purpose of preventing or rather retarding the absorption of the free iodine by the lard—the latter by itself being capable of absorbing more than half its weight of iodine, while even a simple mixture of lard and iodine containing 4 per cent. of iodine becomes attenuated so rapidly that in a few hours there remains not more than one-twentieth of the iodine in a free state. Mr. A. N. D. Pullen, calling attention to these facts, records experiments made to determine the rate of change which a properly prepared iodine ointment undergoes on keeping, and to what extent the use of glycerin and potassium iodide retards the absorption of free iodine. He finds that under the most favorable conditions (with fresh lard), the percentage of free iodine is reduced after four months from the original 4 per cent. to 2.92 per cent., while when old lard was used under otherwise identical conditions, the free iodine was reduced to 2.26 per cent. He explains the function of glycerin and potassium in retarding the absorption of iodine by assuming the basis of the ointment to be an emulsion of glycerin in lard, the glycerin being saturated with potassium iodide. If at the outset all the iodine is dissolved in the glycerin medium a transfer of iodine will take place from this solution to the lard, and, if there were no chemical absorption by the lard, this transfer would come to a standstill when the solution pressure in the two media became equal; but while the iodine which passes into the lard disappears

through absorption the transfer of iodine must continue in that direction. The presence of potassium iodide is, therefore, essential to the conservation of free iodine in notable proportion, and accordingly the percentages of potassium iodide and glycerin to be used rank in importance equally with that of the iodine. It follows from these observations of the author, and his experiments, that the adoption of a standard based on the percentage of free iodine is unwarranted, and that both free and combined iodine must be taken into consideration. —Pharm. Journ. and Pharmacist, Nov. 16, 1912, 610.

Zinc Ointments—Exact Determination of Zinc Oxide.—Dr. E. Büttner recommends the following method for the determination of zinc oxide in ointments or pastes with exactitude. From 0.5 Gm. (if very stiff) to 2.0 Gm. of the ointment is placed into a 150 Cc. separatory funnel; 30 Cc. of water and 50 Cc. of ether are added, and this is followed by the addition of diluted hydrochloric acid with careful shaking until the contents separates into two perfectly clear layers. The aqueous layer is withdrawn, filtered into a breaker and the filter washed with four portions of 30 Cc. of water each with which the ether solution of the fats has been previously washed. From the aqueous filtrate and washings the zinc is then precipitated as carbonate and from its weight the oxide may be calculated.—Pharm. Ztg., lvii (1912), No. 55, 555; from Südd. Apoth.-Ztg., 1912, No. 33.

Unguentum Zinci Oxidi—Manipulation of Process.—Thomas A. Egan suggests that the oxide of zinc be triturated with oil of benne, about 10 per cent., until a smooth paste results, then melt the lard and add it to the resulting paste, stirring the mixture until it is cold.—Proc. Penn. Pharm. Assoc., 1912, p. 295. (E. C. M.)

VINA.

Cinchona Wine—Criticism on the Formula of the Fr. P.—Allard and Nourrison critically discuss the formula of the French Pharmacopœia for preparing cinchona wine, which directs the use of fluidextract made from succirubre bark containing at least 5 per cent. of total alkaloid, instead of preparing it from the drug direct. The authors have determined that the wine does not contain the full amount of total alkaloid, which they attribute to the fact that the fluidextract deposits on standing a resinous precipitate carrying with it some of the alkaloid and in this way depreciates the original

alkaloidal standard.—Pharm. Ztg., lvii (1912), No. 63, 633; from Journ. de Pharm. et Chim., vi (1912), No. 1.

MISCELLANEOUS PREPARATIONS.

Sal Karolinum Factitium—*Legality of Name*.—The City of Carlsbad petitioned that this name be deleted from the Hungarian Pharmacopœia, on account of being a trade-mark infringement. It was further suggested to change the title to *Sal factitum typi salis Karolini*. The Hungarian health board, however, decided that the present title shall be retained, as it is well known to physicians and the public, and that the designation "artificial" cannot cause any misrepresentation or confusion, and is therefore no infringement on the rights of the City of Carlsbad and its "natural" salt.—Ph. Post, 1912, No. 5, 55. (O. R.)

Iodchrom-Catgut—*Preparation*.—M. Claudius recommends iodchrom catgut as a substitute for iod-catgut in cases when a slow absorption of the catgut is desirable. It is prepared from crude catgut, not previously treated in any way (by removal of fat, etc.), which is wound upon a glass spindle and well immersed in an aqueous solution containing 1 per cent. each of iodine, potassium iodide, and potassium bichromate. After a week's immersion the iodchrom-catgut, which is now ready for use, is transferred to into a solution containing one-half per cent. each of iodine and potassium iodide, and is so well preserved. If a less resorbable catgut is desirable, the immersion in the iodine-chrom solution must be prolonged by one or two weeks.—D. Med. Wschr., 1912, No. 22.

Crème Venus Carnis—*Analysis*.—Prepared by the Institut Venus Carnis, A. Hocquette, Pharmacien de Ire Classe, 17 Boulevard de la Madeleine Paris, also London and New York, and extensively advertised as a bust developer. The Deutsche Apotheker Verein, Berlin, ordered an analysis of the preparations, which was done by Prof. L. Schwedes, of the pharmaceutical laboratory of the University Göttingen. He found the Crème to consist of a perfumed ointment, containing 15 per cent. sodium stearate, 35 per cent. water and 50 per cent. glycerin.—Apoth. Ztg., 1912, No. 31, 289. (O. R.)

Venus-Pillen—*Analysis*.—According to the same analyst they are benzoin-coated pills of the average weight 0.275 Gm. The mass consists of an impure extract of licorice, containing iron and aluminum, and the active constituent is 8 Mgm. of ammonium chloride per pill.—Apoth. Ztg., 1912, No. 31, 289. (O. R.)

Hammond's Solution or Liqueur Hammond.—

Strychnine nitrate, or sulphate.....	0.2 Gm.
Iron pyrophosphate, soluble.....	4. Gm.
Quinine bisulphate.....	4. Gm.
Diluted sulphuric acid.....	60. Gm.
Cinnamon water.....	60. Gm.
Syrup of ginger.....	30. Gm.
Syrup of vanilla.....	30. Gm.
Syrup	100. Gm.

Total..... 288.2 Gm.

Dose: Two teaspoonfuls, containing 5 milligrammes of strychnine, to be taken night and morning.—Bull. Sc. Pharm, 1911, 11. (O. R.)

Species Diuretica (Salabar Tea).—

Herba marrubi.	
Herba agrimoniae.....	35 Gm.
Rhizom. rhei.	
Rad. ononidis.....	20 Gm.

It is prepared into an infusion, which is used against gallstones, etc.—Ph. Post, 1912, 803. (O. R.)

Species Stomachicæ Dietl.—

Cort cinnamomi.	
Fol. menth. pip.....	30. Gm.
Herb. centaurei minoris.....	40. Gm.

—Ph. Post, 1912, 816. (O. R.)

Ice Cream—Manufacture by Cold Produced Electrically.—The ordinary method of freezing ice cream by ice and salt is a striking example of economic waste, as 100 gallons require one and one-half tons of ice and 800 pounds of salt and neither of them can be recovered, and the ice melts very rapidly. Electricity is now conserving these materials by producing artificial refrigeration for the manufacture of ice cream and the freezers are also driven by electric power. Statistics show that during five years, from 1906 to 1910, the consumption of ice cream in the U. S. advanced from 55 to 100 million gallons annually. During 1911 about 120 million gallons were consumed, an average of five quarts per capita.—Sc. Am., 1912, No. 26, 579. (O. R.)

Squill Rat Paste—Efficient Formula.—Cæsar & Loretz recommend the following formula for an efficient rat poison: Equal parts of fresh squill bulbs and raw meat (horse flesh) are chopped very fine, well mixed, and slightly toasted with a little fat. It is

then sprinkled with a little ground anise seed and portions of the paste are laid out in places infested by rats.—Pharm. Ztg., lvii (1912), No. 84, 845; from Cæsar & Loretz's Ann. Rep., 1912.

Antiseptics—Influence on Intestinal Flora.—Harris, Norman M., reviews some of the work that has been done to determine the influence of antiseptics on the intestinal flora, and reports a series of experiments made by him at the request of the Council on Pharmacy and Chemistry of the A. M. A., with the object of testing the combined values of methods and drugs in the field of intestinal antiseptics. He concludes that in spite of so-called "favorable reduction," the results obtained by him plainly indicate that antiseptic drugs fail to kill off per gram of feces, millions of indol-producing bacteria, whose habitat is the large intestine. He agrees with Fridenwald and Leitz that regulations of diet, together with the evacuation of the bowels, is the most effectual method that we have on hand of reducing the bacterial content of the large intestine.—J. Am. M. Assoc., 1912, v. 59, pp. 1344-1349. (M. I. W.)

Disinfectant Containing Phenols and Tar Oil—Method of Valuation.—Dr. H. Schneider has made comprehensive studies to determine a convenient and reliable method for the chemical and bacteriological valuation of disinfectants containing phenols and tar oil. He finds a method of fractional distillation, which he describes in detail, as the most practical and reliable for the determination of the principal constituents—the phenols, tar oils, soap and water. For the bacteriological test, whether of disinfectants containing only phenols and soap (cresol-soap solution) or phenols and tar oils, he proposes the use of *Bacillus pyocyaneus* as that test object and phenol (carbolic acid) as the unit. He has found the pyocyaneus values to be the same in Creolin and in Liquor Cresoli Saponatus, G. P. V, while the so-called "Cresolin puris" show just twice the disinfectant value.—Pharm. Ztg., lvii (1912), No. 45, 453; from Ztschr. Disinfection, 1912, Nos. 4 and 5.

Disinfectants—Standardization.—An editorial (J. Am. Med. Assoc., 1912, v. 59, p. 667), comments on the method of standardizing disinfectants with and without organic matter, and expresses the hope that the modified method proposed by Anderson and McClintic will be generally adopted, and that health officials and others having occasion to recommend or to purchase disinfectants will base their opinions on the efficiency, or otherwise, as demonstrated by this method. (M. I. W.)

D—NEW REMEDIES AND TRADE-NAMED PREPARATIONS

Acitrin is the name given to "phenylcinchonic acid æthylester," and is supplied in the form of a yellowish, odorless and tasteless powder, melting at 59° , difficultly soluble in water, but readily soluble in organic solvents. This ester is saponified on boiling with acids or alkalies. It has proven clinically to be valuable for the elimination of uretic deposits, and is recommended for the treatment of gout, ischias, and painful nerve affections, in doses of 0.5 Gm. four times daily, increased to 1.0 Gm. doses three times daily.—Pharm. Ztg., lvii (1912), No. 102, 1029.

Adamon is the name given to a new sedative compound containing about 35 per cent. each of bromine and of borneol in easily splittable combination. It is the dibromdihydrocinnamic acid ester of borneol— $C_6H_5 \cdot CHBrCHBr \cdot CO \cdot O \cdot C_{10}H_{17}$ —and is particularly interesting because it is the first solid ester of bromine and borneol hitherto produced. The ester constitutes a white, nearly odorless and tasteless crystalline powder, having a neutral reaction and melting at 73° . It is insoluble in water, but readily soluble in ether, chloroform, and in carbon tetrachloride. Adamon is supplied both in powder and in form of tablets, the dose being 0.5 Gm.—Pharm. Ztg., lvii (1912), No. 6, 55; from Med. Klin., 1912, No. 2.

Afridol.—The Council on Pharmacy and Chemistry of the American Medical Association describes afridol as sodium hydroxy-mercuric toluylate, $C_6H_3(CH_3)(COONa)HgOH$, 2:3:1. It is an odorless, tasteless white powder, difficultly soluble in neutral or acid media, but soluble in ammoniacal solution containing ammonium chloride. Filtered aqueous solutions of afridol remain unchanged on the addition of ammonium sulphide solution or albumin solutions. It is used as a disinfectant.—J. Am. M. Assoc., 1912, v. 59, p. 1887. (M. I. W.)

Agar sterilisat is the title of a specialty exploited as a vehicle for antigonorrhoeic remedies, such as protargol for example, for conveniently preparing injections. It represents, according to Dr. C. Schindler, a 2.5 per cent. aqueous agar-jelly, which retains its jelly-like consistence even when reduced to 0.5 per cent.—Münch. Med. Wschr., 1912, No. 18.

Aleudrin, a new sedative and hypnotic specialty, is the carbaminic acid ester of *aa*-dichlorisopropyl alcohol. It is supplied in form of a white, odorless, crystalline powder (and in tablets of 0.5 Gm. each); is readily soluble in the usual organic solvents, but with difficulty in water.—Pharm. Ztg., lvii (1912), No. 52, 521.

Antiberiberi is a new specialty prepared by a patented process of extraction from rice-bran, by means of alcohol, which is exploited as a remedy for the "beriberi sickness" frequently occurring in the tropics from the continuous use of rice as food. The extract is black, has an acid reaction, and is dried with difficulty. It is soluble in absolute alcohol and in water, but its chemical nature has not yet been cleared up. It is supplied in form of solution, powder, pills, etc.—D. Med. Wschr., 1912, No. 21.

Argaldin is the name given to a silver-albumin-formaldehyde compound which in contact with mucous membrane splits off formaldehyde. It is exploited as a useful medicament for the destruction of bacteria in the treatment of throat affections and the urinary passages, and is supplied in form of solution and ointment.—Pharm. Ztg., lvii (1912), No. 90, 905.

Argatoxyl is the new name for a 10 per cent. suspension in olive oil of "argentoxy"l—chemically the monosilver salt of p-amidophenyl-arsinic acid. Argatoxyl is recommended for the treatment of septic conditions in general, and in particular in the septic affections following accouchment.—D. Med. Wschr., 1912, No. 12.

Argental—A New White Metal.—A metal or alloy, which possesses all the qualities of silver, except weight, has been evolved by William A. McAdams, after many years of research. Argental is an alloy of aluminum and silver, the affinity of which is produced by chemicals and rare minerals. It is white like silver and not leaden or blue like aluminum and it is stronger than either. Its specific gravity is only one-third that of silver, it will not tarnish or oxidize and it is not affected by acids or alkalies. Argental promises to be an excellent substitute for silver.—Sc. Am., 1912, Vol. 107, 13. (O. R.)

Argentarsyl is the name given to a combination of colloidal silver and iron cacodylate, supplied in the form of a liquid containing 0.05 of the compound in 10 Cc. This new arsenic-silver compound is exploited as a remedy in malaria.—Münch. Med. Wschr., 1912, No. 11.

Aspirin-Soluble is the name given to the readily soluble calcium salt of aspirin which is composed of 90 per cent. anhydrous aspirine and 10 per cent. calcium. It is a white powder, very readily soluble in water, and supplied both in this form and in tablets containing 0.5 Gm. each with about 0.15 Gm. of starch. The corresponding calcium salt of acetyl salicylic acid has been on the market for some time under the name "Kalmopyrin."—Pharm. Ztg., lvi (1912), No. 53, 537.

Assmanogen Tablets, recommended as a remedy in gout, are described as containing the natural residues of the evaporation of the waters of the Assmanshæuser Thermal Springs (which contain much lithia) in their unchanged activity, in combination with radium salts which impart to the tablets a radio-activity of 75 units pro tablet.—Pharm. Ztg., lvii (1912), No. 28, 281.

Asthmolysin is the name given to a sterile, aqueous solution of the suprarenal gland in combination with an extract prepared from the infundibular lobe of the hypophyse. The preparation is exploited as a subcutaneous remedy for the relief of asthma, and is supplied in form of ampouls, each containing 0.0008 Gm. suprarenal extract and 0.04 Gm. hypophyse extract.—Pharm. Ztg., lvii (1912), No. 90, 905; from D. Med. Wschr., 1912, No. 38.

Atophan.—The Council on Pharmacy and Chemistry of the American Medical Association describes atophan as phenyl-quinolin-carboxylic-acid, $C_6H_5N.C_6H_5.CO_2H.2:4=C_{16}H_{11}O_2N$. This substance was described by Doebner and Giesecke in 1887 (*Annalen der Chemie-Liebig*, v. 242, p. 291), who prepared it by warming together pyrrolacemic acid, benzaldehyde and anilin in alcoholic solution. Its therapeutic action was described by Nicolaier and Dohrn in 1908 (*Deutsches Archiv für Klinische Medizin*, v. 93, p. 331). Atophan crystallizes in small colorless needles, melting at 208-209°. It is insoluble in water but readily soluble in alkalis, hot alcohol and boiling glacial acetic acid. It has a slightly bitter taste.—J. Am. M. Assoc., 1912, v. 57, p. 633. (M. I. W.)

Aurochinin is the name tentatively given to the quinine ester of paramido benzoic ester, which is recommended as preferable to the salts of pure quinine for the treatment of malarial affections, being less bitter, and far less liable to produce gastric disturbances. By boiling aurochinin with ten times its weight of water a clear solution is obtained, which, however, acquires a tolerably bitter taste.—Pharm. Ztg., lvii (1912), No. 2, 15; from Therap. d. Gegenwart.

Azodolen is a mixture of equal parts of "Pellidol" (which see) and "Iodolen" (a compound of iodol with albumen), supplied in form of a pale-yellow powder, having no tinctorial properties. By combining the two remedies the epithelicial action of pellidol is reinforced by the antiseptic effect of iodolen.—Pharm. Ztg., lvii (1912), No. 52, 521; from N. Zentralbl. d. ges. Arznei Mittelk., 1912, 88.

Bizyme is a new yeast product, in form of light-brown, small, thread-like stemlets, resembling those of cachou. They have the

typical, strong odor of fresh yeast and an agreeable taste, and are supplied in vials on a layer of dried starch, which serves as an excipient and preservative, the yeast and starch being separated by a layer of cotton. Its use is that of the ordinary medical dry yeasts of the market, but to insure reliable activity it is replaced annually by the manufacturer with the fresh product.—Pharm. Ztg., lvii (1912), No. 102, 1029; from D. Therap. d. Gegenw., 1912, No. 12.

Blennhrosin is a new antigonorrhoeic supplied in the form of gelatin capsules and suppositories, and composed of a double salt of potassium nitrate and hexamethylenetetramin in admixture with some extract of kava-kava.—Pharm. Ztg., lvii (1912), No. 73, 742; from Allg. Med. Centr. Ztg., 1912, No. 36.

Blenotin is the name given to a new antigonorrhoeicum in form of capsules, each capsule containing: Ol. Santali, 0.16 Gm.; Myrrh, 0.02 Gm.; Camphor, 0.02 Gm.; Hexamethylenamin, 0.12 Gm.; Boric Acid, 0.11 Gm.; Champignon extract, 0.02 Gm.—Pharm. Ztg., lvii (1912), No. 37, 374.

Bolus-Soap "Liermann" is the name given to an elain-potash soap containing alcohol and glycerin, but as free as possible of water, combined with 60 per cent. of absolutely germ-free and sterilized bole in finest powder to form a pasty mass. The soap is intended for cleansing the hands before and after surgical operations and for preparing the field of operation according to the "Bolus Method" of Prof. Liermann.—Pharm. Ztg., lvii (1912), No. 6, 55.

Brophenin, according to additional information given in "Med. Klin." (1912, No. 43), is chemically "bromisovaleryl-aminoacetate-paraphenetidin." It is a white powder, melting at 157° C., sparingly soluble in water, and nearly odorless and tasteless, and is supplied both in powder and in form of 0.3 Gm. tablets. Brophenin is claimed to relieve febrile conditions promptly, and is recommended in neuralgia and headaches, particularly influenza and colds, in doses of 0.5 to 1.5 Gm. twice to four times daily.—Pharm. Ztg., lvii (1912), 90, 906.

Calciron is the name of a Viennese specialty exploited for the treatment of tuberculosis, which is stated to contain in a coffee-spoonful the following medicaments: Calcium glycono-lacto phosphoricum, 0.2; potassium sulphoguaiacolate, 0.5, dissolved in syrupus malti 4.5. Adult dose, 3-4 coffeespoonfuls; for children, 1-2 coffeespoonfuls.—Pharm. Ztg., lvii (1912), No. 87, 877.

Cellosa is the name given to hygienic saponaceous tablets, each tablet sufficient for one washing of the hands, which are stated to

be a combination of the finest toilet soap and certain plant substances, together with one of the modern oxygen compounds. The "plant substances" evidently consist, according to an analysis, of a powdered coniferous wood.—Pharm. Zentralh., liii (1012), No. 1, 9.

Chineonal—*A Chemical Combination of Quinine and Veronal*.—It is manufactured by E. Merck, Darmstadt, according to a patented process and contains 63.78 per cent. quinine and 36.22 per cent. veronal, being chemically quinine diethylbarbiturate



Chineonal forms white, needle-shaped, very bitter crystals, m. pt. 132°, soluble in 500 water, 8 alcohol and 12 chloroform. The aqueous solution is very slightly alkline to litmus paper. It is used in febrile infectious disease, as typhoid, influenza, whooping cough, and also as a nerve sedative in neuralgia and seasickness. The dose is 0.6 Gm. for adults and 0.2 Gm. for children and is best administered in wafers or coated tablets on account of its bitter taste.—Ph. Zhalle, 1912, No. 22, 590. (O. R.)

Chlorcalciumgelatin, composed of 5 per cent. calcium chloride and 10 per cent. gelatin (in solution ?), is a specialty recommended for subcutaneous injection in hemorrhagic diathesis, bleeding of the internal organs, pleuritis, Baredow's sickness, and bronchial asthma.—Pharm. Ztg., lvii (1912), No. 93, 940; from Therap. Monatsh, 1912, No. 11.

Chocolin is the name given to an aperient chocolate preparation, consisting of a mixture of powdered cacao, manna, and sugar with 0.5 per cent. of phenolphthalein. The dose of this preparation is 3 to 4 teaspoonfuls, administered in cup of hot water after the evening meal.—Pharm. Ztg., lvii (1912), No. 2, 15.

Choleval is the name given to a 2 per cent. solution of pure colloidal silver, containing 7.5 per cent. of sodium choleinate as a protective ferment, and is used as an antigonorrhoeic injection.—Pharm. Ztg., lvii (1912), No. 97, 980.

Cinnabarsana is the name given to the long-known arsenic paste composed of arsenic acid (2.0), cinnabar (6.0), and animal charcoal, which is recommended by Dr. Zeller for the treatment of skin, mammar, and portio-cancer.—Münch. Med. Wschr., 1912, No. 35.

Codeonal is the name given to a new narcotic and hypnotic specialty, combining the activity of two narcotics, namely codein and diethylbarbituric acid. It is composed of 11.76 per cent. of codeine diethylbarbiturate and 88.24 per cent. of sodium diethylbar-

biturate. Codeonal is supplied in form of powder and tablets, and contains about 7.4 per cent. of codeine.

Codeine Diethylbarbiturate contains about 63 per cent. of codeine and 37 per cent. diethylbarbituric acid, obtained by the combination of these in molecular proportion. It forms handsome obliquely truncated columnar crystals (m. p. 85°), having a bitter taste; soluble in alcohol, chloroform, ether and (in 30 parts of) water, but insoluble in benzol, xylol, and toluol.—Pharm. Ztg., lvii (1912), No. 13, 127; from Berl. Klin. Wschr., 1912, No. 6.

Cycloform is the name applied to isobutyl para-aminobenzoate or para-aminobenzoic acid isobutyl ester. It occurs as a fine white, crystalline, odorless powder that is soluble in ether, benzol, acetone, alcohol and olive oil but is only slightly soluble in water. It melts at 65° . Cycloform acts on wound surfaces and mucous membranes as a superficial and prolonged anesthetic and as a mild antiseptic.—J. Am. Med. Assoc., 1912, v. 59, p. 2150. (M. I. W.)

Digifolin is the name given to a Swiss specialty prepared from digitalis leaves and supplied in form of sterile aqueous solution in ampulles and in tablets. The ampulles contain the active cardiac constituents of the leaves corresponding to 0.1 Gm. of the drug in form of a 10 per cent. infusion (the tablets being of the same strength). Both preparations possess the advantage over the infusion in being free from the irritant digitalis saponins, invariably present in the latter, and in their stability.—Pharm. Ztg., lvii (1912), No. 75, 759; from Münch. Med. Wschr., 1912, No. 36.

Diurase is the name of a diuretic specialty, the description of the exploitive leading to the assumption that it is a compound of alkaline carbonates, glycocoll, and terpinhydrate. It is supplied in form of tablets.

Ebaga is the name given to a new ointment base, which is stated to be composed of various concentrated potassium compounds of stearic and palmitic acid, together with odorless mineral oils. It is a water-soluble, neutral, white mass, of soft consistence, and forms the basis of a number of

Ebaga Preparations, such as: Arsen-Ebaga; Ebaga-Chrysarobin Ointment; Iodine-Ebaga; Iodine-Calomel-Ebaga; Calomel-Ebaga (30%); and Mercury-Ebaga (35% Hg.).—Pharm. Ztg., lvii (1912), No. 102, 1029; from D. Med. Wschr., 1912, No. 48.

Ecrassol is the name given to a storax preparation containing 40 per cent. of liquid storax, which is deprived of its unpleasant odor by the method of preparation. It is supplied in the form of a clear,

brown liquid, of a honey-like consistence, emulsifiable with water and easily removed by washing.—Pharm. Ztg., lvii (1912), No. 57, 576.

Elektrauro, a colloidal form of gold obtained by an electrolytic method, has been used with great advantage by C. Feyerabendt for the relief and eventual cure of articular rheumatism, from which he suffered personally, after other remedies had previously failed in a number of attacks. Absolute relief followed the intravenous injection of the remedy into the large vein of the upper arm within twenty-four hours, and an apparent cure was effected after four daily administrations. A relapse, however, occurred a few weeks later, but yielded promptly to the same treatment and has not recurred since, after an interval of about three months.—Pharm. Ztg., lvii (1912), No. 43, 433.

Eosin-Selenium is the name given to a remedial agent which is reported to have a specific action on tumors and is particularly recommended as a remedy for cancerous affections. So far its effects have only been studied upon animals, such as mice for example. When properly prepared, eosin-selenium is a red powder readily soluble in water, producing at once a bright, clear solution. It appears to be quite unstable, and liable to become inactive even when protected carefully from air and light.—Pharm. Ztg., lvii (1912), No. 8, 74.

Ergotin-Koffein is the name of a specialty exploited for the treatment of myocarditis, arteriosclerosis, and cardiacneurose. Its composition is not given. It is supplied for subcutaneous use in ampulles and for internal use in form of tablets.—Münch. Med. Wschr., 1912, No. 19.

Ervasin is the name given to an acetyl cresotinic acid, obtained by annexing a non-poisonous acetyl group to cresotinic acid. It is a definite compound, melting at 140-141°, and crystallizing in quadratic prisms; soluble in ether, alcohol and chloroform; insoluble in water. Ervasin is recommended as an antirheumatic and is supplied in form of tablets.—Pharm. Ztg., lvii (1912), No. 30, 303; from Med. Klin., 1912, No. 14.

Ervasin-Calcium is the calcium salt of acetylparacresotic acid, distinguished from "Ervasin" by its solubility in water.—Pharm. Ztg., lvii (1912), No. 97, 980.

Erystypticum is the name given to a Swiss specialty, composed of the active constituents of hydrastis and ergot, the latter in form of a specialty marketed by the same exploiters under the name of "Secacomin."—Pharm. Ztg., lvii (1912), No. 14, 135.

Eubementh-Catarrh Protective is a specialty composed of astringent substances, combined with adrenalin and chloreton, in form of a methol ointment.—Pharm. Ztg., lvii (1912), No. 25, 253.

Faqol is a creosote derivative obtained by condensation from cresote and formalin, which is supplied in form of a white crystalline powder, odorless and insoluble in water, but soluble in alkali, its solution becoming green on addition of ferric chloride.—D. Med. Wschr., 1912, No. 23.

Fundal is the name given to an ointment base which, according to an examination by C. Mannich and L. Schweden, is a mixture of woolfat, 64 per cent., vaselin, 30 per cent., and water, 6 per cent.—Pharm. Ztg., lvii (1912), No. 85, 857.

Glaudnitrin is the name given to an extract of the infundibulum of the pituitary gland, freed from albumins and rendered sterile, 1 Cc. of the preparation representing 0.2 Gm. of the fresh infundibular substance. The preparation is supplied in ampulles, and is recommended as a uterine, vascular, and cardiac tonic.—Pharm. Ztg., lvii (1912), No. 81, 816.

Glycasine is the protected name for a new lubricant for the fingers and surgical instruments, composed essentially of alkaline stearates and glycerin and forming a soft, ointment-like mass. It is neutral, non-irritant, and germ-free; forms a turbid solution with water, and containing 60 per cent. of glycerin, it is permanently sterile. The new lubricant adheres well to the hands and instruments and does not in any way interfere with the action of the medicaments employed in operations.—Pharm. Ztg., lvii (1912), No. 52, 522.

Glycocithin is the name given "lecithin-chocolate tablets," each containing 0.1 Gm. of egg-lecithin.—Pharm. Ztg., lvii (1912), No. 29, 294.

Glycotauro is the name applied to a purified ox bile standardized to contain 50 per cent. of bile salts free from bile pigments. Each 1 Gm. represents approximately 10 Cc. of fresh ox bile. Glycotauro occurs as a soft, semisolid mass of light brown color, bile-like odor and slightly bitterish taste. It is readily soluble in water and in alcohol.—J. Am. Med. Assoc., 1912, v. 59, p. 2066. (M. I. W.)

Gonogen is the name of a vaccine produced by the combination of various young gonococcus cultures, and is exploited for the treatment of all gonorrheal affections. It is claimed also to be particularly serviceable as an immunizing remedy. Gonargin is supplied for these purposes in ampulles each containing 1 Cc., but

of different strengths, which is indicated on the label. Containing 0.5 per cent. of phenol, it possesses practically permanent stability.—Pharm. Ztg., lvii (1912), No. 59, 597.

Gonaromat Taschner is an antigonorrhoeic remedy for internal use, supplied in the form of enteric capsules, containing in addition to East Indian sandal oil (93-94%) a mixture of the volatile oils of nutmeg, chamomile, cinnamon, peppermint, and cloves.—Pharm. Ztg., lvii (1912), No. 75, 759; from Allg. Med. Centr. Anzeiger, 1912, No. 37.

Grotan is the name given to 1 Gm. tablets of a complex sodium compound of chlorcresol, containing free chlorcresol beside the normal chlorcresol compound, in molecular combination. It is explained that similar alkali compounds are produced by dissolving the halogenphenols or their homologues in an organic solvent and treating by themselves with alkali hydroxides, or alkaline salts, like alkali carbonates and the ordinary halogenphenol alkali salts. The products so obtained are non-hygroscopic, nearly odorless, and possess unlimited stability—the sodium compound being esteemed the most efficient and suitable for disinfectant purposes. *Grotan* has been shown to possess extraordinary bactericidal power, coupled with insignificant toxic action and freedom of irritant effect upon the skin. Although soluble only to the amount of about 2 per cent. in cold water, it is readily soluble in luke-warm water. Moreover, since a 0.5 per cent. solution is sufficiently effective for all disinfectant purposes, 1 or 2 per cent. solution of *grotan* exceed in power the highest demand that may be made upon its activity.—Pharm. Ztg., lvii (1912), No. 102, 1029; from Münch. Med. Wschr., 1912, No. 49.

Gynoval.—The Council on Pharmacy and Chemistry of the American Medical Association describes *gynoval* as isoborneol isovalerate $\text{CH}_3.\text{CH}(\text{CH}_3).\text{CH}_2.\text{COO}.\text{C}_{10}\text{H}_{17}$, the isovaleric acid ester of isoborneol. It occurs as a colorless neutral fluid of a peculiar aromatic odor and mild oleaginous taste. It is difficultly soluble in water, but easily dissolves in alcohol, ether, acetone, chloroform, benzol and petroleum-benzin. It is stated to have a boiling point of 132° to 138° , under 12 Mm. pressure, and a specific gravity of 0.952—0.957 at 15° .—J. Am. M. Assoc., 1912, v. 58, p. 411. (M. I. W.)

Hediosit is the protected name for the α -glycoheptonic acid lactone, which is exploited by its manufacturers as an innocuous substitute for sugar in cases of diabetes, with the claim of being readily

absorbed and having the effect of diminishing the glycosuria in doses well tolerated up to 30 Gm. pro die. It is produced by the action of hydrocyanic acid upon grapesugar, resulting in the formation of a nitril, which by saponification is readily converted into glycoheptonic acid, both *a*- and *b*-glycoheptonic acid being formed. By removing water under the specifications of the patented process these acids are converted into lactones, representing their inner anhydrides, with the formula $C_7H_{12}O_7$. The *a*-lactone—hediosit—forms strongly shining trimetric crystals, melting at 145° to 148° ; readily soluble in water, difficultly soluble in alcohol, and insoluble in ether. The *b*-lactone possesses similar properties but melts at 151° C. Hediosit is supplied in powder and in form of cubes weighing $2\frac{1}{2}$ Gm. each.—D. Therap. d. Gegenw., 1912, No. 6.

Hexal is the name applied to hexamethylenamine salicylsulphonic acid. It is prepared by the interaction of an alcoholic solution of salicylsulphonic acid and an aqueous solution of hexamethylenamine. Hexal occurs as a white, odorless crystalline powder, readily soluble in water, slightly soluble in alcohol and difficultly soluble in ether. It is claimed that hexal has the action of hexamethylenamine combined with an anesthetic and astringent action due to the salicylsulphonic acid. It is given in doses 1 Gm. (15 grains) three to six times a day.—J. Am. Med. Assoc., 1912, v. 59, p. 1971. (M. I. W.)

Hormonal is a product obtained from the spleen, and is recommended as an efficient preparation for promoting peristaltic action in cases of acute intestinal paralysis (by intravenous injections), or in chronic intestinal paresis (by intragluteal injection). In large doses it produces diarrhoea, which, however, is not harmful. In cardiac affections hormonal must be used with caution.—Berl. Klin. Wschr., 1912, No. 19.

Hycyan is the name given to mercuric oxycyanide tablets of characteristic form and color to prevent accidental poison. They are semi-circular, with scalloped margins, of a blue color, and readily soluble in water, each tablet being hermitically enclosed in a semi-circular celluloid capsule, and corresponding to 0.5 Gm. of the medicament. One tablet dissolved in half a liter of water thus forms a 1:1000 mercuric oxycyanide solution, which is used for disinfecting the hands, the instruments, the surface to be operated upon, etc., in surgical practice.—Pharm. Ztg., lvii (1912), No. 93, 940; from Med. Klin., 1912, No. 38.

Kascin-Hydrol, recommended as a diabetic remedy, is described as being composed of equal parts of magnesium perhydrol (with 15% Mg. O₂) and lime casein (calcium phosphate casein).—*Pharm. Ztg.*, lvii (1912), No. 37, 374.

Kephalidon is the protected name for the hydrobromide of aminoacet-p-phenetidin-caffeine, which is obtained by heating 1 mol. each of amino-p-phenetidin, caffeine, and hydrobromic acid in (1.5 liters) water until solution is effected, and then evaporating the solution *in vacua* at a low temperature. *Kephalidon* is a white crystalline powder, having a bitter taste; slowly soluble in cold water, more readily in warm water and in alcohol. It is exploited as a remedy in migrain, headache, neurasthenia, etc., and is given in doses of 0.3 to 1.5 Gm. per day, dissolved in water, coffee or tea.—*Pharm. Ztg.*, lvii (1912), No. 91, 918.

Kresatin is the trade-name given to acetic acid ester of *m*-cresol— $\text{CH}_3\text{C}_6\text{H}_4(\text{OCH}_3\text{CO})$ —which is recommended for the treatment of nasal or throat affections, either pure, in admixture with alcohol or oils, or as spray. It is a colorless oily fluid having a peculiar odor, almost insoluble in water, but readily soluble in the ordinary organic solvents; miscible to form clear solution with paraffin and fixed oils, and volatilizable with the vapor of water.—*Pharm. Ztg.*, lvii (1912), No. 52, 522; from *Journ. Am. Med. Assoc.*, 1912.

Kresophen is described as being an agreeable odorous woodtar almost devoid of coloring properties.—*Pharm. Ztg.*, lvii (1912), No. 25, 253.

Kupfer (Copper) Lecithin is a new compound of cupric chloride with lecithin (containing 4.5% Cu.), which is exploited in form of an ointment prepared with alcohol and without fat, and is recommended for the treatment of cuticular cancer.—*Pharm. Ztg.*, lvii (1912), No. 91, 918; from *D. Med. Wschr.*, 1912, No. 45.

Laibose is the name given to a new food, composed of the solids of pure whole milk and the entire digestible substance of whole wheat. The method of manufacture involves a process of converting the entire well-cooked whole wheat into a soluble state by a physiological method without chemical action, and incorporating the clarified solution obtained with the unskimmed milk, which is then evaporated *in vacuo*. The average composition of this food is: Total dry solids, 94; protein, 18; fat, 17; carbohydrate, 55; ash, 4. It is a brownish-yellow powder, and the odor is very pleasant and appetizing.—*Pharm. Journ. and Pharmacist*, Jan. 20, 1912, 80.

Laudanon is the name given to a new preparation of opium, which is exploited as a substitute for opium in several different combinations, in the form of ampulles, each containing 1.1 Cc. of a solution as a dose.

Laudanon I contains: Morphine, 1 Mgm.; codeine, 1 Mgm.; papaverine, 2 Mgm.; thebaine, 0.5 Mgm.; narceine, 0.5 Mgm.

Laudanon II contains: Morphine, 10 Mgm.; narcotine, 2 Mgm.; codeine, 1 Mgm.; papaverine, 0.1 Mgm.; thebaine, 0.5 Mgm., and narceine, 0.1 Mgm.—Pharm. Ztg., lvii (1912), No. 93, 940; from Münch. Med. Wschr., 1912, No. 46.

Leukogen is the name of a vaccine, consisting of an emulsion of deadened staphylococci, the cultures employed for its preparation being derived from different kinds of staphylococci, the most frequently used vaccines consisting of a mixture of *Staphylococcus albus*, *Staphylococcus citreus*, and *Staphylococcus aureus* in equal proportion. All of the vaccines are accurately dosed according to their content of deadened germs, of 10, 25, 50, 100, and 500 millions in 1 Cc. of the emulsion, which is uniformly free from living germs. Like "Gonogen" (which see), leukogen possesses practically permanent stability, being protected by the addition of 0.5 per cent. of phenol. It is supplied in ampulles and small vials which must be vigorously shaken before using.—Pharm. Ztg., lvii (1912), No. 59, 597.

Liq. Hydrastis Boyer is according to Dr. H. Freund a new styptic specialty containing synthetic hydrastinine as its essential ingredient, and recommended for use in gynæcological practice in the same way as the official fluidextract of hydrastis canadensis. The exploiters also supply the synthetic hydrastinine in form of dragees and tablets (each containing 0.025 Gm. of hydrastinine), and have long supplied an aqueous solution for subcutaneous use.—Pharm. Ztg., lvii (1912), No. 52, 522.

Luminal is the name given to a new powerful hypnotic for subcutaneous use, chemically representing a phenylethylbarbituric acid, and differing from veronal in that an ethyl group is replaced by a phenyl rest. Luminal is a white, odorless, faintly bitter, crystalline body, melting at 170°-172°; nearly insoluble in cold water, but crystallizing in shining leaflets from hot water; readily soluble in organic solvents and in dilute alkalies, and precipitated unchanged from the latter solution by acids. On prolonged standing or continued boiling of its alkaline solutions it is decomposed, 1 mol. of carbon dioxide being eliminated, and phenylathylacetylurea formed

and precipitated. It is supplied in form of powder and 0.1 Gm. tablets, and also in form of luminal-sodium, which is extremely soluble in water and consequently a somewhat hygroscopic powder, but convenient for preparing the subcutaneous injection. The 20 per cent. solution of this salt may be boiled during two minutes without decomposition and remains perfectly clear for ten to fourteen days, but after that a voluminous precipitate of the above mentioned decomposition product begins to deposit.—Pharm. Ztg., lvii (1912), No. 35, 353; from Münch. Med. Wschr., 1912, No. 17.

Maltyl-Maté is the name of a combination of maltyl (a dry extract of malt) and of "mate" or Paraguay tea, in the form of tablets, each representing 0.02 Gm. of the caffeine-like alkaloid of the "mate," and weighing 5 Gm. The specialty is exploited as a stimulant and tonic.—Pharm. Ztg., lvii (1912), No. 85, 856; from Med. Klin., 1912, No. 38.

Malz-Eiweiss (Malt Albumen) is a specialty prepared by a patented process from wheat flour and barley malt. The large starch-granules are removed by centrifugation and the residual "albumen-malt-nutrient saline extract" is evaporated *in vacuo* at a low temperature. The dry product contains about 34 per cent. of albumen, 2 per cent. of nutrient salts, 46 per cent. soluble malto-dextrin, and 18 per cent. of soluble starch. It is used as food by pouring warm or cold milk upon four spoonfuls of the preparation and immediately consuming it, before the malt-albumen is softened, which impairs the taste. It may also be consumed as an addition to other foods.—Pharm. Zentralh., liii (1912), No. 1, 11.

Melubrin is the trade-name given to the sodium salt of phenyl-dimethylpyrazolonamidomethansulphonic acid, a new antipyretic which is exploited as a specific in articular rheumatism. It occurs in the form of a fine crystalline powder, soluble in an equal weight of water and in 10 parts of methyl alcohol, but almost insoluble in all the other ordinary solvents. Melubrin is formed by the action of formaldehydebisulphit solution upon phenol-2-3-dimethyl-4-amido-pyrazolon, and purifying the product of the reaction of several recrystallizations. Being unstable in aqueous solutions, it should not be dispensed in the form of (liquid) mixtures.—Pharm. Ztg., lvii (1912), No. 20, p. 198, and No. 23, p. 233.

Menthosalan "Jahr" is the title of an embrocation recommended for the relief of gout, rheumatism, migraine, etc. It is stated to consist of equal parts of oil of gaultheria, menthol, and lanolin, and is supplied in the form of tubes.—Pharm. Ztg., lvii (1912), No. 23, 233.

Molyform is the name given to a molybdenum compound which is recommended as an antiseptic in the treatment of surgical-gynecological and dermatological affections. It is supplied in form of a fine white powder, having an astringent taste, is soluble to the amount of 10 per cent. in water, and gives the usual reactions of molybdic acid and its salts. Molyform is used in form of aqueous solution, powder, and ointment.—Med. Klin., 1912, No. 20.

Mycardol is the protected name given to the specialty previously described as "Ergotinaffeine." It is supplied in solution (in ampulles) and in form of tablets, each tablet containing 0.15 Gm. Caffein Citrate and 0.85 Gm. Ergotin.—Münch. Med. Wschr., 1912, No. 28.

Mystin, a new milk-preservative, it is claimed, cannot be detected by analysts. George A. Stokes states that it consists of formaldehyde and sodium nitrite; the latter renders any of the usual tests for formaldehyde useless. The nitrite, however, is indicated by most of the methods for fat-determination (such as the Gerber and Schmidt). In such case distillation with phosphoric acid sets formaldehyde free.—Pharm. Journ. and Pharmacist, March 23, 1912, 395.

Nacasilicium is the name given to a mixture of potassium silicate, 20.0, sodium silicate, 20.0, and milksugar, 60.0, which is given in doses of 0.5 Gm. three times daily by Dr. A. Keller to reinforce the local application of "Cinnabarsana" (which see) in the treatment of certain cancerous affections.—Münch. Med. Wschr., 1912, No. 35.

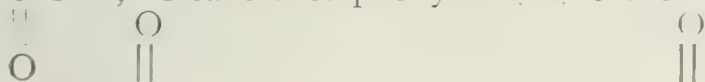
Narcophin is the name given to morphine and narcotine meconate, having the formula $C_7H_4O_7 \cdot C_{17}H_{19}NO_3 \cdot C_{22}H_{23}NO_7 + 4H_2O$. The salt contains 31.2 per cent. of morphine, and, in consideration of the usual slight alkalinity of bottle glass, it is rendered faintly acid with added meconic acid. Narcophin is a white, crystalline powder, readily soluble in water by shaking and rapidly soluble in warm water, forming a clear solution and having a bitter taste. It is supplied in ampulles containing 1.1 Cc. of a 3 per cent. solution, and in tablets each containing 0.015 Gm., and is recommended as a substitute for morphine, devoid of the unpleasant side-effects of the latter.—Pharm. Ztg., lvii (1912), No. 57, 576.

Narkodeon is the protected name for pastilles exploited for the treatment of catarrhal affections of the air passages, each pastille containing 0.001 hydrochloride of narcotine, 0.005 hydrochloride of codeine, 0.005 balsam of tolu, and 1.25 pulvis gummosus sacchar.—Pharm. Ztg., lvii (1912), No. 93, 940.

Neosalvarsan is an improved form of "salvarsan," produced by combining the latter with formaldehyde sodium sulfoxalate (Hydraldit), a reducing agent employed in certain technical operations. The "new" salvarsan is characterized by forming directly a neutral solution in water (thus obviating the circumstantial precautions prescribed for the solution of salvarsan in soda solution), which may be at once used for hypodermic injection. Neosalvarsan is moreover less toxic, less liable to form more toxic derivatives by antoxydation, and has given favorable clinical results. The dose is about one-third larger than that of the original salvarsan.—Pharm. Ztg., lvii (1912), No. 32, 323.

Neosalvarsan—Nature of.—An editorial (J. Am. Med. Assoc., 1912, v. 59, p. 1295) discusses the chemistry of the new salvarsan which is being introduced by the manufacturers as practically identical with salvarsan in its effects, but which dissolves in water to form a neutral solution and which can therefore be injected directly without further manipulation. In this new preparation the basis of salvarsan (3-diamine-4-dihydroxy-1-arseno-benzene) is not combined with hydrochloric acid to form the hydrochlorid, but with the radical of sodium formaldehydesulphoxylate or sodium methanalsulphoxylate ($\text{CH}_2\text{O})\text{OSNa}$. Approximately two parts of this modified salvarsan mixed with one part of inert material constitute the preparation now on the market under the name of neosalvarsan. Sodium formaldehyde sulfoxylate was introduced as being of value in etching colored textiles and as a reducing agent in calico printing with indigo. Bernthsen, the discoveror of the salt, assumes that formaldehyde sulphonylic acid as a condensation product of formaldehyde, CH_2O , and an acid, H_2SO_2 , which appears to be the hyposulphurous acid formerly discussed in chemistries as theoretically possible. As Bernthsen believes this acid to possess the structure

H-S-O-H , he calls it sulphonylic acid to show the relation



of its radical $-\text{S-O-H}$ to the carboxylic group $-\text{C-O-H}$, commonly found in organic acids, sulphur having taken the place of carbon. (M. I. W.)

Neosalvarsan.—The Council on Pharmacy and Chemistry of the American Medical Association presents the following description: Neosalvarsan is a mixture of sodium 3-diamino-4-dihydroxy-1-arsenobenzene-methanal-sulphoxylate. $\text{NH}_2.\text{OH}.\text{C}_6\text{H}_3.\text{As}:\text{As}.\text{C}_6\text{H}_3.\text{H}_3\text{OH}.\text{NH}(\text{CH}_2\text{O})\text{OSNa}$, with inert inorganic salts. The arsenic

content of three parts of neosalvarsan is approximately equal to two parts of salvarsan.

Since neosalvarsan is merely a soluble compound of salvarsan, its actions and uses are the same as salvarsan. It is said to be tolerated better and consequently may be employed in larger doses. The average single dose for men is 0.75 Gm. (12 grains) administered by intravenous or intramuscular injection.—J. Am. M. Assoc., 1912, v. 59, p. 879. (M. I. W.)

Neo-Vascol is the name given to an unperfumed vasenol toilet cream, of pure white color, exploited as a vehicle for preparing ointments and pastes of all kinds, and also for direct application as a cooling remedy in burns.—Pharm. Ztg., lvii (1912), No. 43, 434.

Ninhydrin is the trade name given to "triketohydrindenhydrate," the reagent proposed by Abderhalden for albumen, peptones, polypeptides, amido acids, and the pregnancy diagnosis. It is supplied in tubes, each containing 0.1 Gm.—Pharm. Ztg., lvii (1912), No. 85, 856.

Novatophan is described by the Council on Pharmacy and Chemistry as the ethyl ester of paratophan. It occurs as a slightly yellow, odorless and tasteless crystalline powder that melts at 76° and is insoluble in water but readily soluble in alkalies, hot alcohol and strong acids. Its uses and doses are the same as atophan.—J. Am. Med. Assoc., 1912, v. 59, p. 1971. (M. I. W.)

Noxiform is the name given to tetra brompyrocatechin bismuth, and may be regarded as an improved form of "Xeroform," in which the phenol group is replaced by the pyrocatechin group. It is recommended as a perfectly non-irritant remedy for the treatment of affections of the eyelids.—D. Med. Wschr., 1912, No. 11.

Ortizon is the name given to a solid and stable form of hydrogen peroxide, prepared with the aid of urea, which is exploited for hygienic and pharmaceutical uses.—D. Chem. Industr., 1912, No. 20, 631.

Paratophan.—The Council on Pharmacy and Chemistry of the American Medical Association describes paratophan as methyl-atophan, 6-methyl-2-phenyl-quinoline-4-carboxylic acid, $\text{CH}_3 \cdot \text{C}_9\text{H}_4 \cdot \text{N} \cdot \text{C}_6\text{H}_5 \cdot \text{COOH}$, $6:2:4=\text{C}_{17}\text{H}_{13}\text{O}_2\text{N}$. Paratophan occurs as a yellow crystalline powder melting at 228° , soluble in alcohol, ether, chloroform and alkalies, but insoluble in water. It has a slightly bitter taste and a faint odor. If paratophan be heated above its melting point carbon dioxide is liberated and methyl-phenyl-quino-

line, $\text{CH}_3 \cdot \text{C}_9\text{H}_5\text{N} \cdot \text{C}_6\text{H}_5$, melting at 68° , is produced.—J. Am. Med. Assoc., 1912, v. 59, p. 1623. (M. I. W.)

Pasta "Liermann" is an aseptic Bolus-wound paste (see "Bolus-Soap" "Liermann") composed of 50 per cent. of germ-free bole in form of the finest possible powder, alcohol and glycerin, together with 1 per cent. of Azoderm (see Proceedings, 1911, 128). It represents a yellowish ointment-like paste, having an alcoholic odor, and is supplied in sterilized tubes of 50 to 100 Gm. capacity, constructed so that the cap of the tube may be re-sterilized by dipping it in boiling water after removing a portion of the paste.—Pharm. Ztg., lvii (1912), No. 6, 55.

Pellidol is the diacetyl derivative of amidoazotoluol, which constitutes a pale red-yellow powder but is absolutely free from dyeing properties, such as are characteristic of amidoazotoluol (or scarlet-red), but like the latter, possesses epithelizing properties and is exploited for this purpose. Being readily soluble in the ordinary organic solvents as well as in petrolatum, fats and oils, ointments prepared with pellidol, if this is not present in excessive quantities, contain the medicament in a dissolved condition.—Pharm. Ztg., lvii (1912), No. 52, 522; from N. Zentralbl. f. d. ges. Arzneimittell., 1912, No. 88.

Peristaltin.—This patented preparation of cascara sagrada has been studied by Tschirch and Monikowski, who find it a yellow, somewhat hygroscopic powder which is soluble in water and alcohol and from which they obtained the following substances:

(1) *A glucosidal mixture* hydrolysing to rhamnose and cascarol (m. p. 218°) $\text{C}_{15}\text{H}_{10}\text{O}_5$, forming an acetate melting at 204° - 205° ; Chrysophanol (pure chrysophanic acid, m. p. 193° - 194°); emodin monomethylether (a trace). The total amount of anthraquinone derivatives is about 1.16 per cent., calculated as emodin. (2) A yellow coloring matter in quantities too small for accurate examination. (3) A fermentable hexose, 20 per cent. (4) Pentose, 2 per cent. (5) Ash, 0.5 per cent. (6) Water, 4.2 per cent., and (7) other anthraquinone bodies yielding nitro-bodies resembling chrysammic acid, 14 per cent. The paper gives physical data relating to each of the substances isolated, including spectra characteristics.—Arch. d. Pharm., 250 (1912), No. 2, 92. (H. V. A.)

Phascoli Tablets (Tabuletta Phascolis Bellmann) are prepared from an extract of bean-legumes, exploited as a substitutes for the infusion of the legumes employed in the dietetic treatment of

glucosuria. Each tablet is claimed to be the equivalent of 2.5 liters of the infusion (tea) ordinarily prescribed.—Pharm. Ztg., lvii (1912), No. 102, 1029.

Phobrol is a solution of 50 per cent. chlor-*m*-cresol in potassium resinoleate and therefore probably identical with "Eusapyl," which is no longer manufactured. It is miscible in all proportions with water and in the form of a 0.5 per cent. dilution applicable in all branches of disinfectant practice. For the disinfection of the hands it is used in form of a 1 per cent. alcoholic solution; for the disinfection of sputum, containing germs, in 10 per cent. solution. The solutions are perfectly clear and nearly colorless, easily prepared, non-irritant and non-toxic.—Pharm. Ztg., lvii (1912), No. 62, 622.

Phylacogenes are specific vaccines exploited by an American manufacturing firm for a variety of ailments. Among these are: Erysipelas-phylacogen, gonorrhœa-phylacogen, mixed-infection-phylacogen, and rheumatism-phylacogen.—Pharm. Ztg., lvii (1912), No. 90, 906.

Pilka is the new protected name given to the so-called "Herb. Thymi et Pinguicalæ Dialysatum Golay," hitherto also exploited under the name of *Thymipin*. The speciality is recommended for the treatment of whooping cough.—Pharm. Ztg., lvii (1912), No. 20, 298.

Pilka, it is explained, is the new name for "thymipin" applied only to the product exported to foreign countries, the original name, thymipin, being retained for its exploitation in Germany.—Pharm. Ztg., lvii (1912), No. 25, 253.

Pinsol is a new tar specialty, said to be prepared from woodtar by distillation under reduced pressure, and described as being a clear, honey-yellow to brown liquid, of a honey-like consistence, mild empyreumatic odor, and mild aromatic-empyreumatic, followed by faint bitter taste. It is claimed to contain all the active constituents of woodtar with freedom from the disagreeable components of the latter, for which it is exploited as a substitute, as well as for *Ol. Rusci*, etc., in therapeutic practice.—Pharm. Ztg., lvii (1912), No. 97, 980.

Proferrin.—The Council on Pharmacy and Chemistry of the American Medical Association describes proferrin as a compound of iron and milk casein containing iron equivalent to about 10 per cent. elementary iron and phosphorus equivalent to about 0.5 per cent. elementary phosphorus. Proferrin is a brown powder, almost

odorless and tasteless, insoluble in water and dilute acids, slowly soluble in alkalies.—J. Am. Med. Assoc., 1912, v. 58, p. 1356. (M. I. W.)

Propæsin.—The Council on Pharmacy and Chemistry of the American Medical Association describes propæsin as paramido-benzoic acid propyl ester, $C_6H_4.NH_2COO(C_3H_7)1:4$. It is prepared by esterification of paraminobenzoic acid with propyl alcohol. Propæsin occurs as a fine, white or colorless, odorless nearly tasteless powder, which produces numbness when placed on the tongue. Propæsin is very slightly soluble in water and is not readily wetted by this solvent. It is soluble in alcohol, benzene, chloroform and ether, and melts at 73° .—J. Am. Med. Assoc., 1912, v. 58, p. 33. (M. I. W.)

Prophylacticum Mallebrein is the name given to a new disinfectant recommended for the treatment of tuberculous and other infectious diseases of the respiratory organs. It consists of the neutral chlorate of aluminium ($Al.(ClO_3)_3$) and is employed in 1 per cent. solutions for inhalations and gargles.—Ztschr. f. Tuberkulose, xliii, No. 3.

Pyrothen is a new disinfectant exploited particularly for disinfection in cattle plague, which is said to be prepared by heating 60 p. of cresol, 60 p. of 60 per cent. sulphuric acid and 15 p. of fuming sulphuric acid together. It forms a yellow syrupy liquid, having a pungent odor of sulphurous acid and creosote, and a strong acid reaction, which is employed in 1 or 2 per cent. solution. A solid form of pyrothen is also supplied, composed of 6.3 zinc sulphate, 25.0 pyrothen, 18.7 sodium sulphate, and 10.0 sodium sulphite.—Pharm. Ztg., lvii (1912), No. 97, 980.

Saluderma has been examined by C. Mannich and L. Schwedes, who describe it as an ointment-like mass, containing in rounded figures 35 per cent. soda soap (anhydrous), 32 per cent. water, 22 per cent. of mineral matter having the composition of natural lime stone, 2 per cent. of glycerin, 3-4 per cent. of unsaponifiable, fluorescent substance (soluble in petrolatum ether), and from 3 to 5.6 per cent. of ester-like substance having the characters of cinnamain.—Pharm. Ztg., lvii (1912), No. 35, 353.

Salvarsan.—The Paris correspondent (J. Am. Med. Assoc., 1912, v. 58, p. 645) reports three new deaths from salvarsan. (M. I. W.)

Salvarsan—Present Position.—An editorial (J. Am. Med. Assoc., 1912, v. 59, pp. 1295-1296), commenting on a number of papers and discussions on the use of salvarsan which appear in the

same number of the Journal, points out that it is evident from current literature that salvarsan has not lived up to the early promises for it does "not affect a complete cure of syphilis in the sense Ehrlich anticipated." It is generally accepted by well-informed practitioners that to rely on salvarsan to cure syphilis is to court disaster. The practitioner should therefore combine with the use of salvarsan other established measures of treatment. As a symptomatic remedy it is generally accepted as being of value. It causes syphilitic lesions to disappear, some with great rapidity, others less rapidly. It is quite probable that serious results, particularly deaths following the intravenous injection of salvarsan, are much more frequent than would be inferred from the literature, even with the innumerable accidents which are recorded, and its routine use as a remedy in syphilis will not be established until we become familiar with its dangers, both immediate and remote. (M. I. W.)

Salvarsan—Use of.—Fordyce, John A., in discussing the administration of salvarsan in syphilis, points out that the efficiency of this drug bears a direct relation to the age of the infection. In the early stage three or four doses supplemented by mercury will in many cases cure the disease in from six months to a year. The florid stage requires more intensive treatment. In the primary stage it is possible permanently to reverse the blood reaction with salvarsan, but as the disease grows older, the probabilities of changing it with only a few doses grow less.—J. Am. Med. Assoc., 1912, v. 59, pp. 1231-1235. (M. I. W.)

Salvarsan and Neosalvarsan.—In an address entitled "The Chemical Constitution of Organic Antiseptics," Dr. Joseph Kahn gives an interesting description of these two substances. Salvarsan was the first practical result of the "anchoring groups" theory of Professor Erlich of Germany. According to the theory, a compound consists of a "pharmacophore" group (active group), and an "anchoring" group (adhering group). It is only when the compound is held (anchored) to the tissues by the "anchoring" group that the whole complex molecule can take effect and exert its characteristic physiological action, the selective action of a compound for certain cells depending on the combining together particular groups in the molecule in some sort of chemical connection with the cell-substance. Erlich conceived that chemicals might be found in complexes that would destroy the essentially different calls of the infecting parasites, without harming the normal cell-structure of the body. The antiseptic action of arsenophenol (a derivative of benzene) is due primarily to the arseo group in which the arsenic

is trivalent, and secondarily to the phenol group (OH group). With the introduction of the amido group (NH_2) into the arsenophenol molecule, its antiseptic power is increased while its toxicity is diminished. In dioxy-diamidoarsenobenzol and its dihydrochloride, better known as 606 (No. 606 is a series of products prepared by Erlich) or "Salvarsan," we thus find the first practical application of chemicotherapy. In the many attempts that were made in the past to combat diseases due micro-organisms by the injection of antiseptics into the blood, salvarsan was the first that proved a success. Salvarsan destroys the pathogenic spirilla of an important group of blood diseases without being toxic or injurious to the body that harbors them. Like many other valuable drugs, Salvarsan is not free from objectionable features. Chief among these are its auto-oxidation, the oxidation product being exceedingly toxic (being an arsenical compound in which the element arsenic is in a low state of oxidation, it is readily oxidized by the air), and the fact that its solution is never neutral, an acid or an alkaline solution always causing pain and irritation. Salvarsan, $\text{C}_{12}\text{H}_{12}\text{N}_2\text{O}_2\text{As}_2\text{HCl}$, dioxydiamidoarsenobenzol dihydrochlorid, is an acid soluble salt, i. e., is soluble in water, with an acid reaction. On neutralizing with alkali, NaOH solution, the free insoluble base, dioxidiamidoarseno benzol is obtained which constitutes the neutral suspension used for intra-muscular injection; on the further addition of alkali the suspended substance re-dissolves forming an alkaline solution, which is used for intra-venous injection. Great care must be taken not to have an excess of alkali, as it always causes disturbances. Many of the objectionable results caused by salvarsan are, no doubt, due to an excess of alkali used. With the limited laboratory facilities of the ordinary practitioner such procedure is certainly a great disadvantage.

Neosalvarsan of "914," Erlich's modification of salvarsan, proves to be a decided improvement. It is a yellowish powder entirely neutral, and soluble in water, affording a neutral solution. The solution of neosalvarsan is therefore very easily prepared by dissolving the neosalvarsan in freshly distilled water. The use of NaOH is consequently entirely eliminated, together with a source of error or injury to the patient. Furthermore, with such a simple method of solution, solutions of neosalvarsan can be and always should be prepared shortly before use, thus lessening the oxidation by the air, for neosalvarsan, like salvarsan, readily oxidizes into a highly toxic compound.

Chemically, neosalvarsan is a condensation product of dioxidiamidoarsenobenzol with the ammonium salts of formaldehydesulphoxylic salt of formaldehydesulphoxylic acid.

REACTION.

Dioxidiamidoarsenobenzol—Sodium formaldehydesulphoxylate.—

$$\text{C}_6\text{H}_3\text{OH}.\text{NH}_2\text{As}:\text{As}.\text{C}_6\text{H}_3\text{OH}.\text{NH}_2 + \text{OH}.\text{CH}_2\text{O}.\text{SONa} =$$

$$\text{C}_6\text{H}_3\text{OH}.\text{NH}_2\text{As}:\text{As}.\text{C}_6\text{H}_3\text{OH}.\text{NH}.\text{CH}_2\text{OSONa} + \text{H}_2\text{O}$$
Dioxidiamidoarsenobenzol—Sodium-mono-methane-sulphinate
Water.

While salvarsan contains two amido groups and can react with sodium formaldehydesulphoxylate to form mono- or di-derivatives, neosalvarsan represents the mono- product. With the introduction of the sulphoxyl group into the salvarsan molecule its therapeutic effect seems to be increased, while its toxicity seems to be diminished. Sodium formaldehydesulphoxylate may be considered as a compound formed by the direct union of formaldehyde and acid sodium hyposulphite, $\text{CH}_2\text{O}.\text{HNaSO}_3$. Sulphonic acids bear the same relation to hyposulphurous acid, H_2SO_3 , as sulphonic acids bear to sulphurous acid, H_2SO_3 .—Proc. New York Pharm. Assoc., 1912, pp. 173-175. (E. C. M.)

Sanasklerose is the name given to 0.5 Gm. tablets, containing a mixture of 3 p. 40 per cent. lecithalbumin, 1 p. potassium iodide, and 1 p. nutrient salt. The nutrient salt (Sal. physiologicum nutriens) is composed of 7.5 p. potassium sulphate, 250 p. 30 per cent. magnesium peroxide, 0.25 p. silicicacid, 0.25 sodium fluoride, 20 p. sodium citrate, 20 p. potassium-sodium tartrate, 100 p. sodium phosphate, 40 p. ferrous sulphate, 160 p. sodium bicarbonate, and 160 p. sodium sulphate. *Sanasklerose* is used in calcareous concretions of the veins, chronic bronchial inflammation, asthma, lues, etc.—Allg. Med. Zentralztg., 1912, 578.

Sanocalcin is the name given to "Calciumglycerinolactophosphate," which is claimed to be a definite chemical compound. It is supplied in form of a white, amorphous, water-soluble powder, and is usually administered subcutaneously and intravenously in form of 1 per cent. solution, rarely per os, in which case it is given in doses of 0.1 to 0.5 Gm. *Sanocalcin* is recommended for the treatment of acute and chronic infectious diseases, and is supplied in a variety of combinations with specific remedies, such as tuberculin, arsenic, and the different sera in vogue.—Pharm. Ztg., lvii (1912), No. 72, 728.

Sanocalcin is now conceded by the manufacturer to be simply a mixture of calciumglycerophosphate and calcium lactophosphate in molecular proportions, and not a definite chemical compound, as originally claimed. It is described as being difficultly soluble in water, and when its solutions are heated is again deposited; hence the sterilization of its aqueous solutions can be effected only by a special process, which has been patented by its exploiters.—*Ibid.*, No. 81, 816.

Scabosan is the name given to a "salicyl-nicotine-soap," exploited for the treatment of scabies. The soap consists of a soft, white mass, of ointment-like consistence, does not stain, and is perfectly odorless. It contains 10 per cent. salicylic acid and 0.08 per cent. nicotine.—*Pharm. Ztg.*, lvii (1912), No. 102, 1029; from *Münch. Med. Wschr.*, 1912, No. 49.

Secalan-Golas is the protected name for a dialysate of ergot, obtained from the fresh drug, and contains the active constituents of the latter in a stable form. It is stated that 1.0 secalan corresponds to 0.001 of active substance, equal to 3.0 of ergot.—*Pharm. Ztg.*, lvii (1912), No. 14, 135.

Sedo-Roche-Tablets, exploited for the exhibition of sodium bromide in a pleasant vehicle, are tablets weighing 2 Gm., each containing 1.1 Gm. sodium bromide, 0.1 Gm. sodium chloride, flavored with condiments composed of vegetable extracts, together with a little fat. One tablet dissolved in 100 Gm. of hot water produces an agreeable broth resembling a well salted meat broth in taste, but actually represents a 1 per cent. solution of sodium bromide.—*Münch. Med. Wschr.*, 1912, No. 36.

Sinecain is a 3 per cent. solution of quinine hydrochloride, containing 3 per cent. of antipyrin and 0.005 per cent. of adrenalin, and is exploited as a local anesthetic, in ampulles each containing 1 Cc. of the medicament.—*Pharm. Ztg.*, lvii (1912), No. 90, 906; from *Med. Klin.*, 1912, No. 43.

Stovaine.—The London correspondent (*J. Am. Med. Assoc.*, 1912, v. 59, p. 1901) reports the case of a man, aged 68, who died under spinal anesthesia induced by injection of stovaine for an abdominal operation at St. Thomas Hospital. At the inquest the anesthetist explained that he had administered stovaine in 350 cases and that this was the first patient he had lost. (M. I. W.)

Styptase is a new hæmostatic speciality which is stated by its exploiters to be composed of: Calcium Tannochlorate, 0.218; Ha-

mamelis (? Rep.), 0.8; Fluorates, 0.1. It is supplied both in liquid form and as tablets.—Pharm. Ztg., lvii (1912), No. 39, 394.

Systogen is the name given to an ergot substitute which is claimed to be chemically "paroxyphenylæthylamin," a compound which, like the active constituents of ergot, contains the typical tyrosin-nucleus. *Systogen* is described as a strong base, melting at 160° . Being sparingly soluble in water, it is supplied in the form of hydrochloride, forming pearly glistening crystals and having a faint bitter taste.—Münch. Med. Wschr., 1912, No. 25.

Tannaphthol is a new intestinal disinfectant and astringent, representing a condensation product of albumen tannate and benzoenaphthol. It is an odorless and tasteless powder and is recommended for internal use in form of tablets, externally in form of ointment and dusting powder.—Pharm. Ztg., lvii (1912), No. 60, 606.

Thiolan is the name given to a sulphur ointment which is said to be prepared by dissolving 2.0 to 2.5 Gm. of sulphur at 50° - 100° in 1 Kgm. of fat, adding 45.0 to 50.0 Gm. of "oleum sulfuratum," and finally the freshly prepared precipitate (sulphur ?) from 40.0 to 50.0 Gm. of calcium sulfuratum, from which the water has been removed on the filter by absolute alcohol or pure glycerin as completely as possible, which is incorporated very thoroughly.—Münch. Med. Wschr., 1912, No. 35.

Toluta is the name given to a new whooping cough remedy which is exploited in two potencies, with certain differences in composition

Toluta I is stated to contain golden sulphide of antimony, potassium sulphoguaiacolate, sodium sulphate, senna, extract of licorice, oil-sugar, and pure cultures of *Bacillus bulgarius*.

Toluta II, which is intended for advanced stages of the ailment, contains in each tablet: Heroin hydrochloride, 0.0002 Gm. and hydropyrine, 0.1 Gm., together with cultures of *Bacillus bulgarius*, cacao, and sugar.—Pharm. Ztg., lvii (1912), No. 93, 940.

Tonsillitan is the name given to a specialty recommended for the treatment of angina, tonsillitis, pharyngitis, etc., which presumptively is a combination of bolus, carbon, camphor, extractum myrtilli, extract of malt, with aromatics, in form of troches having a honey-like consistence.—Pharm. Ztg., lvii (1912), No. 17, 167.

Trizalin is the name given to a specialty, supplied in sterile solution, containing caffeine and cocaine in chemical combination with valeric acid, and is recommended as a non-toxic (? Rep.) substitute for morphine salts in cardiac, respiratory, and dyspeptic affections, exclusively for relief of pain.—Med. Klin., 1912, No. 24.

Trypasafrol is the tentative name given to an active substance belonging to the group of saffranin, which is exploited for the treatment of the trypanosomen infection.—Berl. Klin. Wschr., 1912, No. 31.

Tulisan is the name given to a new inhalent (or spraying) fluid recommended for the relief of asthmatic attacks, which is said to be composed of 73.59 per cent. of an inhalent fluid prepared from Balsam of Peru, 0.94 per cent. of Alypin nitrate, 0.47 per cent. of Eurnidrin, 5 per cent. of Suprarenin (1:1000), and 20 per cent. of Glycerin. The remedy is applied by nasal inhalation with the aid of a spray apparatus (*Tulisan Spray*) of special construction.—Pharm. Ztg., lvii (1912), No. 9, 86.

Tyramine.—The Council on Pharmacy and Chemistry of the American Medical Association describes tyramine as the hydrochloride of the base para-hydroxy-phenyl-ethyl-amine $\text{CH}_3\text{C}_6\text{H}_4\cdot\text{CH}_2\cdot\text{CH}_2\cdot\text{NH}$ obtained synthetically. The base para-hydroxy-phenyl-ethyl-amine was first isolated by Barger from ergot and also prepared synthetically by him by the reduction of para-hydroxy-acetonitrile with sodium in alcoholic solution (Transactions of the Chemical Society, Vol. 95, 1909). It is chemically and physiologically related to epinephrine ($\text{C}_6\text{H}_3(\text{OH})_2(\text{CHOH}\cdot\text{CH}_2\text{NHCH}_3)$). Tyramine occurs as an almost white crystalline powder, easily soluble in water, forming a neutral solution.—J. Am. Med. Assoc., 1912, v. 58, p. 1356. (M. I. W.)

Uteramine.—This is the name (copyrighted by a Swiss firm) for the synthetic ergot substitute para-oxy-phenyl-ethyl-amine. It is described by C. Bühner who quotes Dr. Heimann's favorable physiological report, based on study of its action in 208 cases where ergot was indicated.—Schweiz. Wschr. f. Chem. u. Pharm. 1 (1912), No. 34, 517. (H. V. A.)

Vanadarsin is the name given to a 0.1 per cent. solution of a compound of vanadium and arsenic, which is recommended in doses of 5 to 10 drops in cases for which the action of arsenic and phosphorus is desirable—the latter being replaced by vanadium. The preparation has a fine yellow color, is almost odorless, and said to possess great stability. It is supplied in ampuls of 1 Cc., containing 2 Mgm. of the compounds.—Münch. Med. Wschr., 1912, No. 33.

Veronal.—An editorial (J. Am. Med. Assoc., 1912, v. 58, p. 196) discusses veronal poisoning and points out that the slow excretion of the drug is an element of danger in a repetition of the dose within too brief intervals. According to Grober its toxicity is greater than

is commonly assumed and it seems advisable to guard most carefully against the indiscriminate sale of veronal and related derivatives and to sound a warning against unauthorized repeat prescriptions. (M. I. W.)

Veronazetin is the name given to a compounded specialty in form of tablets recommended and exploited as an efficient hypnotic and sedative, two tablets corresponding to 0.3 Gm. sodium diethylbarbiturate, 0.25 Gm. phenacetin, and 0.025 Gm. codeine phosphate. The combination of "veronal" with phenacetin and codeine effected by this mixture is claimed to render "veronazetin" superior to other hypnotics.—Pharm. Ztg., lvii (1912), No. 20, 198.

Verrulin is the name given to tablets stated to be composed of 40.0 Magnes. hydrico-carbonicum, 2.5 Rhizoma Rhei, 2.0 Argilla, 2.0 Bolus rubra, and 4 drops of Ol. Menthæ Piperitæ. This medicament is exploited as an internal remedy for the removal of warts.—Pharm. Ztg., lvii (1912), No. 93, 940.

Vishamyl is the name given to a new iron preparation exploited for the production of tonic baths, which are recommended in anæmia, etc., in order to avoid the internal administration of iron preparations. It is described by its exploiters as being a combination of iron, nitrogen, sulphur and carbon.—Pharm. Ztg., lvii (1912), No. 48, 483.

Viraltan is a new remedy exploited for the treatment of gonorrhea, supplied in form of an agreeably tasting solution, which is free from fat and balsams, and is described as representing a "methyaminobenzoyltetraborate of sodium."—Pharm. Ztg., lvii (1912), No. 48, 483.

Wermolin is an emulsion of wormseed oil (*oleum chenopodii anthelmintici*) which is said to be composed of castor oil and wormseed oil as active constituents, with saccharin and volatile oils to correct the taste. It is supplied in 50 Gm. vials, each containing 1.5 Gm. of the wormseed oil, and is claimed to be efficient as a vermifuge in doses of a tea to a tablespoonful, administered morning and night, according to the age of the infested person—the dose being repeated twice during the interval in the case of adults.—Pharm. Ztg., lvii (1912), No. 102, 1029; from D. Med. Wschr., 1912, No. 50.

Yohimbin-Schmidt, a specialty introduced under this designation in veterinary practice, has been subjected by Prof. R. Kobert to chemical and physiological examination and proven to owe its phar-

macological activity almost exclusively to veratrine or, as it is now named "Cevadine." Prof. Kobert's paper should be consulted in the original in *Pharm. Ztg.*, lvii (1912), No. 33, 332-333.

Yohydrol is the new protected name given by its exploiters to yohimbine hydrochloride.

Zebromal—*A Bromination Product of Cinnamic Acid Ester*.—Under this trade mark E. Merck markets phenyldibrompropionic acid ethylester or cinnamic acid ethylester dibromide, $C_6H_5-CHBr-CHBr-COO.C_2H_5$. Zebromal is a white, monoclinic crystalline powder, with a faint, aromatic odor and a taste of cinnamic ester. M. Pt. 74-75°. Insoluble in water, very soluble in ether and chloroform, but less soluble in alcohol. Its bromine content is 47.5 per cent. Zebromal is used as a substitute for alkali bromides, especially in epilepsy. Its dose is slightly larger than NaBr. It should be kept in well-closed bottles protected from light.—*Ph. Zhalle*, 1912, No. 22, 591. (O. R.)

Zeozonpaste is the name given to a specialty in form of an ointment, which is recommended as a prophylactic for sunburns, etc., and is supplied in different concentrations, presumably containing as active ingredient an ortho-oxidation derivative of æsculin (from 3 to 7 per cent.), similar to a previously described preparation exploited under the name of *Aq. Zeozoni*.—*Pharm. Ztg.*, lvii (1912), No. 5, 47.

Patents and Trade-Marks.—Wilbert, M. I., discussing the present status of the law relating to patents and trade-marks, points out some of their shortcomings, and expresses the belief that for the protection of the inventor, no less than for safeguarding the inherent rights of the public, it would appear desirable to simplify the present legal procedure necessary to establish the validity of a patent and also to extend to patents generally the system of preliminary publication now used in connection with the registration of trade-marks.—*J. Am. Med. Assoc.*, 1912, v. 59, pp. 834-835. (M. I. W.)

Patents and Trade-Marks.—Stewart, F. E., discusses the relation of the patent and trade-mark laws to materia medica nomenclature, and suggests that the U. S. Pharmacopœial Revision Committee issue an annual list of new drugs, giving proper names to them and including trade names as synonyms.—*J. Am. Med. Assoc.*, 1912, v. 59, pp. 836-838. (M. I. W.)

MATERIA MEDICA

A—GENERAL SUBJECTS

The Wholesale Drug Trade—Modern Evolution.—In concluding an interesting review of the transactions of the thirty-seventh annual convention of the National Wholesale Druggists Association, in which liberal quotations of topics which appeal with equal force to the retail dealer, are made on a variety of topics, Dr. C. Mahlon Kline points out the marked evolution that has modernly been effected in consequence of the demands made upon the purveyors of drugs in order to keep in harmony with those made upon the dispensers of medicaments. He says:

"I would say that, to my mind, the meeting of the National Wholesale Druggists Association shows very clearly the tendency of the times. The wholesale dealers of ten years ago were not, nor did they have to be, familiar with the professional side of pharmacy. This condition is not true today. The wholesaler has been compelled to assume responsibilities as to the quality of the drugs and medicines he handles, and this has driven him to interest himself in the study of drug substances; therefore, discussions having to deal with quality, standards, scientific methods of production or handling, are now heard with the greatest interest, and the purely commercial side has been forced to recede somewhat from its former pre-eminent position. This, I think, is bound to result in considerable benefit to the consumer of medicinal substances."

In this admirable report Dr. Kline quotes the opinions expressed by some of the foremost representatives of the best known drug and manufacturing firms of our country, on many subjects that may be consulted with advantage by the retail pharmacist.—*Amer. Journ. Pharm.*, Jan., 1912, 24-33.

Quality of Swiss Drugs.—Dück reports his experiences in examination of drugs and chemicals found in Swiss commerce, including such products as cod liver oil, wax, oil of peppermint, condurango, orange flower water, potassium carbonate, myrrh, zinc oxide, gauzes, etc. For details, the reader is referred to the original article.—*Schweiz. Wschr. f. Chem. u. Pharm.* 1 (1912), No. 34, 513. (H. V. A.)

Drugs of German East Africa.—Dr. K. Braun in "Der Pflanze" describes 73 plant products sold in native markets and Indian Bazaars of German East Africa, giving native name, uses and method employed. Among those of pharmaceutical interest are

the following aromatics: Amber, ajowan from *Carum copticum*; the fruit of *Cuminum Cyminum*, cinnamon, nutmeg, curcuma, patchouli and black pepper, while the following are used as medicine: The seed of *Nigella indica* as febrifuge and stomachic; sulphur (in Sesame oil) for skin troubles; myrrh from *Commiphora Abyssinica* as application to wounds; blue stone (with bruised leaves of *Vigna sinensis*) used as caustic paste for cancerous growths; asafetida, chiefly as an amulet; senna as purgative; alum as astringent; aloes as stomachic and purgative; dill (in watery paste) for rubbing the breast in fever; ginger (in watery paste) for rubbing forehead in headache; fœnugreek (decoction) in gonorrhea; black antimony as cosmetic. Unfortunately, while the writer occasionally mentions that a certain article is imported, he makes no clear distinction, especially as far as spices are concerned, as to which are native grown.—Schweiz. Wschr. f. Chem. u. Pharm. 1 (1912), No. 20, 289. (H. V. A.)

Quality of Drugs.—Kebler, L. F., calls attention to the work that is being done in connection with the Bureau of Chemistry to improve the quality of drugs on the American market. He divides drugs into three classes, chemicals, crude drugs, and prepared mixtures, such as pills, tablets galenicals, etc. Chemicals, he states, are, on the whole, of satisfactory quality, while crude drugs are commodities which cause the greatest amount of disturbance. He calls attention to a number of crude drugs that have been found to be below the standard prescribed by the Pharmacopœia, and points out that with the operation of the proviso in Section 7 it is extremely difficult to eradicate adulteration in its various forms. He also states that a considerable number of tablets and pills offered to the trade and to the medical profession direct have been examined and found wanting in certain respects, but concludes that since laboratory work was begun there has been marked improvement in the chemicals, crude drugs and mixtures, though there is room for further improvement.—J. Am. Med. Assoc., 1912, v. 59, pp. 1604-1606. (M. I. W.)

Quality of Unimportant Drugs.—Puckner, W. A., presents some observations on the unreliability of unimportant medicaments, and points out that the quality of an article or a commodity, in general, is directly dependent on demand and competition. That is, if there is a large demand for an article, and if a considerable number of firms put it on the market, then its quality is likely to be of a high order. On the other hand, substances which are not sold under competition are frequently unreliable and inferior. Puckner calls

attention to a number of articles sold as medicine that were found to be distinctly inferior to the quality claimed for them.—J. Am. Med. Assoc., 1912, v. 59, pp. 1156-1158. (M. I. W.)

Powdered Drugs—Commercial Quality of Some of the More Important.—Henry G. Greenish and Miss Dorothy J. Bartlett have examined a large number of samples of powder drugs of commerce, comprising 33 of gentian and 11 each of nuxvomica and ipecacuanha, and describe the methods and results in a lengthy paper read at an evening meeting of the Pharmacopœial Society of Great Britain. The results, which were obtained both by chemical and microscopical methods, show that

Commercial Powdered Gentian still leaves much to be desired. Intentional adulteration with foreign vegetable powders still continues. Carelessly cleaned root is ground to powder, and a large proportion of the samples are deficient in water soluble substances.

Powdered Nux Vomica of commerce is of satisfactory quality. All the samples had normal microscopic characters, and contained alkaloid ranging from 2.38 to 2.80 per cent. This is particularly gratifying in view of the fact that the powdered nux vomica of French commerce has recently been found to be frequently adulterated with ground olive stones and with raspings of ivory nuts.

Powdered Ipecacuanha of commerce was not quite so satisfactory, although with one exception they contained sufficient total alkaloid to comply with the recommendation of the Committee of Reference in Pharmacy. Two of the samples were not quite pure, one was probably Cartagena ipecacuanha and one other was not ipecacuanha at all—possibly supplied by mistake, however.—Pharm. Journ. and Pharmacist, Feb. 17, 1912, 201-203.

Plants of Dioscorides—Comparison with Modern Specimens.—E. Emmanuel, after describing the various manuscripts of Dioscorides, the earliest printed editions of the works of the founder of materia medica and the most comprehensive modern translations, mentions the "Codex Constantinopolitanus" of A. D. 512 as the oldest and in some respects the finest of the manuscripts, particularly since it is richly illustrated. An exact replica of this manuscript was published in 1906, in an edition de luxe and the illustrations found therein have been carefully compared with the herbarium of oriental plants owned by M. Boissier of Chambes, Switzerland. His reports on the botanical origin of the 381 plants pictured in this oldest manuscript of Dioscorides is given in the article in tabulated form along with the previous conclusions of Tschirch as published

in the latter's Handbuch der Pharmakognosy.—Schweiz. Wschr. f. Chem. u. Pharm., 1 (1912), Nos. 4 and 5, 45 and 64. (H. V. A.)

Plant Specimens—Preserving and Mounting.—William Huren demonstrated before the Botanical Society of Western Pennsylvania a simple and effective method of preserving plant specimens which will revolutionize the present slow and laborious mounting of herbarium collections. The fresh specimens are subjected to process of drying by means of steam, cold air and a press, which preserves their natural color. After this they are imbedded or inlaid on a soft surface, as blotting paper, cardboard, silk, etc., and a final protective coating of liquid celluloid is applied. The specimens thus finished retain their natural color, resemble paintings and are practically indestructable.—Sc. Am., 1912, Vol. 107, 10. (O. R.)

Medicinal Plants—Comparative Activity.—Dr. James Burmann has conducted a line of experiments since 1907, assaying each year fresh plants of aconite, belladonna, colchicum, *Digitalis ambigua* and *Digitalis purpurea*. The plants were wild grown; the aconite being collected in Canton Vaud; the belladonna around Aigle, the colchicum also around Aigle; the *Digitalis ambigua* in Canton Valais and *Digitalis purpurea* in Alsace. All were collected at flowering except colchicum, which was gathered at seeding time (June-July). The assays were by the gravimetric method of Keller; the digitalis species being assayed for digitoxin. The results are tabulated below:

Aconite (percentage of aconitine) :

1907—0.104%	1909—0.042%
1908—0.100%	1910—0.054%
1911—0.094%	

Belladonna (percentage of atropine) :

1907—0.094%	1909—0.045%
1908—0.082%	1910—0.046%
1911—0.099%	

Colchicum (percentage of colchicine) :

1907—0.190%	1909—0.144%
1908—0.160%	1910—0.148%
1911—0.200%	

Digitalis ambigua (percentage of digitoxin) :

1907—0.134%	1909—0.067%
1908—0.120%	1910—0.069%
1911—0.148%	

Digitalis purpurea (percentage of digitoxin):

1907—0.078%	1909—0.033%
1908—0.063%	1910—0.037%
1911—0.070%	

—Schweiz. Wschr. f. Chem. u. Pharm., 1 (1912), No. 1, 2. (H. V. A.)

Medicinal Plants—Successful Cultivation in Pennsylvania.—Mr. John A. Borneman, who has charge of a drug farm at Glenolden, Pa., says that while the cultivation of medicinal plants has been advocated from time to time for the past fifteen years, it is only in recent years that the subject has been given the attention it deserves. Since it has been proven that the cultivated plant yields as large and more often a larger amount of alkaloids or glucosides than the same species of the wild plant, there should be no reason why the cultivation of medicinal plants should not make rapid strides in this country, and in support of this view he gives an interesting description of the methods of cultivation, collection, curing, etc., of plant drugs which have been successfully produced on the drug farm mentioned under his care—some of the growing plants being shown in photographic plates. He gives in each case specific directions regarding the selection of locality, soil, time of planting, care and time of collection and drying, yield, assay, etc., from which the following brief abstracts must suffice.

Digitalis purpurea L. is one of the easiest plants to cultivate. The first year's plants, show a higher percentage of glucosides than that required by the pharmacopœia, and therefore should be admitted to the U. S. P. It would then pay to cultivate the drug as the yield of the first year is about three times that of the second year. The plant can be collected any time after flowering or even as late as September or October; should be dried by artificial heat, the ovens well ventilated and the heat gradually raised to 100° C—drying being complete in about 24 hours. The dry plants should be kept in air-tight containers with some freshly slaked (burnt ? Rep.) lime. The assay of first year's digitalis leaves gave: Digitoxin, 0.304 per cent. Physiological report: Minimal lethal dose 0.6 Cc., corresponding to 166.669 of normal.

Atropa Belladonna L.—The plant can be harvested any time in fall, but care should be taken to gather the plant at the first sign of the leaves becoming yellow. There is a rapid deterioration of the alkaloid as soon as the plant begins to turn, therefore it is advisable to look after the plant the latter part of August. The drying should be rapid and artificial means employed. The yield of

fresh belladonna the first year is about twelve tons per acre. *The assay of plants of the first year gave 0.58 per cent. of mydriatic alkaloid from the leaves and 0.53 per cent. from the roots.*

Hyoscyamus niger L., the author has found to be the most difficult of all the Solanaceae family to cultivate. If care is taken with the plants, one is repaid with very beautiful specimens, but very much disappointed with the resulting assay, which very rarely comes above 0.06 per cent. Unless, therefore, it is possible to bring the assay up to standard it will not pay to raise this plant. *The assay of the second year leaves gave 0.06 per cent. of mydriatic alkaloid.*

Cannabis sativa L. and *C. indica* can be readily cultivated. The plants make a very rapid growth and often reach a height of twelve feet in three months. The male plants should be removed, and the plants harvested about the time the seed develops.

Hydrastis canadensis L. Propagation is best carried on by means of divided roots; the plant can be transplanted during spring or late in fall. The cultivation is very simple and all the plant requires is that it be kept free from weeds and grass; it does not require any cultivation to speak of, the proper location being shady woodland, which has previously been put in shape by removing all shrubbery and wild vegetation, and has soil that is rich in leaf mould. Artificial shade, although at first expensive, is considered more advantageous however, and in the author's opinion would pay in the increased yield of rhizomes.—*Amer. Jour. Pharm.*, Dec., 1912, 546-554.

Cultivation of Drugs—Suggestions Regarding its Possibilities with Particular Reference to the British Possessions.—J. H. E. Evans contributed a highly interesting paper at the 1912 meeting of the British Pharmaceutical Conference, written with the purpose of awakening greater interest in the cultivation of drugs in the British possessions. He says that while the Government Departments in the United States of America, Germany, and elsewhere foster the cultivation of drugs, what advancement is made in Great Britain is almost entirely the result of private enterprise. The facts to which he draws attention in particular are in brief, the following: The present sources of supply of crude vegetable drugs are, in quantity and quality, restricted in area, and thus dependent on forces which cannot be controlled—such as weather, time and method of collection, available labor, carelessness in methods of preparing for market. He considers that the influence

of the natural causes might often be controlled, both as regards quantity and quality, by systematic cultivation, but such cultivation must be scientific and organized, and some of the conditions to be observed in such cultivation are discussed. He further considers it quite possible that much of the vegetable materia medica might be cultivated in the British Colonies, and that improved methods of transport encourage this object. Finally, the author mentions a few products which are at present cultivated more or less successfully: *Calumba*, in Ceylon; *Eucalyptus* and *Patchouli* in the tropics; *Belladonna*, in England, France, and America; *Coca*, in the West Indies, Ceylon, and Zanzibar; *Kola-nut*, in the tropics generally; *Cinnamon*, in Ceylon; *Ginger*, in Japan; *Turmeric*, in the tropics; *Ipecacuanha*, in India; *Valerian*, in England, Germany, and Austria; *Manna*, in Sicily; *Benzoin*, in the Straits settlements, etc., etc.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1912, 451-454.

Drug Plant Cultivation.—True, R. H., in a review of experiments that have been made in drug plant cultivation, points out that the conditions under which wild drugs are collected from the woods and fields lead to considerable waste, and enumerates *hydrastis* as an illustration of the wild drugs that have been all but exterminated. He states that by cultivating drugs, instead of collecting them wild, a certain degree of control over the products may be gained, and expresses the belief that the key to the situation lies in the recognition of the fact that the problem of plant improvement is one of hereditary tendency and capable of regulation through scientific effort.—J. Am. M. Assoc., 1912, v 59, pp. 1606-1607. (M. I. W.)

Plants—Chemical Protection Against Cold.—It has been suggested by Lidforss that the conversion into sugar of the starch in the leaves of plants which are green in winter helps to protect them against cold, and it has been shown by Buhlert that plants having high resisting power towards cold have high osmotic power. Experiments made by N. A. Maximon have now shown that the addition of certain neutral organic substances raises the cold-resisting power of plants in a notable degree—sugars having the greatest effect, glycerin next, then monohydric alcohol and acetone, while mannite has only slight action.—Pharm. Journ. and Pharmacist, Dec. 14, 1912, 749; from Ber. d. D. Bot. Ges., xxx (1912), 52.

Effect of Trypsin on the Sprouting and Growth of Plants.—A botanical investigation by Dr. Strujev, who finds that corn and sunflower seeds scarcely sprout in perfectly sterile artificial soils but

will sprout if a trypsin solution is added. The proper strength of such solution is 2 per cent. and the proper amount is 0.5 to 2 Cc. to each pair of seeds (the amount of nutritive fluid not being stated). More than 2 Cc. of the trypsin solution does not produce as large a plant as does 0.5 to 2 Cc.—Schweiz. Wschr. f. Chem. u. Pharm., 1 (1912), Nos. 29 and 30, 433 and 449. (H. V. A.)

Vegetable Drugs—Collection and Yield on Drying.—C. Frommann contributes some practical information concerning the choice, method of collection and preparation for the market, of vegetable drugs in localities in which the particular drug desired occurs in abundance, and publishes a long list of drugs, exhibiting the yield of air-dry drug from 100 parts of the fresh material, constructed mainly on his personal observations. This interesting paper is here referred to for the benefit of persons who are favorably situated and desire to engage in the collection of vegetable drugs.—Pharm. Ztg., lvii, (1912), No. 59, 594-596.

Ash Determination of Vegetable Drugs—Desirability of Acid Ash Determination and Uniform Method.—An editorial emphasizes the value of ash determination of powdered drugs, as an indication of quality and purity and points out the necessity of determination of the acid insoluble ash, as well. The acid insoluble portion remaining after treatment of the ash with hydrochloric acid, showing practically the relative proportion of sand, dirt, etc., in the sample. Much attention has been given to the determination of ash content of drugs by many investigators, both foreign and in the United States, but without specifying methods. The true ash content of a drug is found when the sample is free of all foreign matter, for which reason a washed sample should be used. The cleansing process must, of course, be carried on with extreme care, that none of the tissue be carried away, that none of the salts of the drug be leached out or washed away and that no foreign salts be added. Rapid rinsing with distilled water in a wicker wire container would, no doubt, answer. The washed sample must then be dried to a constant weight at 100° C. Then the absolute ash content of the sample may be had which would serve as a comparative guide to the per cent. of inorganic impurities in the unwashed sample. Such examination following micro-analysis with chemical tests would well determine the quality and purity of the drug.—Pac. Pharm., Nov., 1912, 153. (C. M. S.)

Drugs—Standardization.—Sollmann, Torald, in discussing the current problems of pharmacology and therapeutics, points out that the standardization of drugs is a matter which is vital to the

progress of therapeutics. Most important at the present moment is probably the progress of pharmacopœial revision and the relation between pharmacists and physicians because its proper solution is essential to applying the drug standards in a satisfactory manner.—J. Am. M. Assoc., 1912, v 59, p. 833. (M. I. W.)

Bio-assay—Purpose and Limitations.—Wood, Horatio C., points out that the underlying principle of physiologic standardization, or as those engaged in this work prefer to call it, the bio-assay, is to determine the quantity of a given sample of drug required to produce some easily recognizable effect on a lower animal. By comparing this with the amount of a standard preparation which will produce the same reaction, one can figure out the relative therapeutic dose. While the bio-assay must be acknowledged as a great step forward in the direction of accuracy in our materia medica, its field of usefulness is at present pretty narrowly limited by certain factors, some of which seem to be inherent in the method and some of which are due to the undeveloped status of the art.—J. Am. M. Assoc., 1912, v 59, pp. 1433-1434. (M. I. W.)

Progress in Methods of Physiological Testing.—Prof. C. R. Eckler says that the activity of many drugs cannot be determined by chemical analysis, either because "their chemistry is improperly understood or is of such a nature as not to admit of qualitative methods," and he describes the methods, both qualitative and quantitative, of testing some of such drugs physiologically. He instances digitalis, ergot and Indian Cannabis as being among such drugs as cannot be assayed by chemical means, and describes the methods by which their physiological activity may be determined. For the digitalis series of drugs, including with that drug, strophanthus, convallaria, squill and apocynum, four methods of examination are used in this country: the guinea-pig, cat, twelve-hour frog, and one-hour frog heart method. Ergot is tested by the uterus-test, blood-pressure method on dogs, and the cock's-comb test. Indian Cannabis is tested by comparison of the effects, on several pairs of dogs, of a standardized drug and the drug which is under examination. The dose of the drug to be standardized which produced a certain effect, is compared with that of the standard preparation which was required to produce the same effect, and by comparison of results on several animals conclusions are drawn. He says that the state of affairs concerning physiological methods and standards is somewhat similar to that which existed a number of years ago regarding chemical methods and standards, when every chemist chose his own methods and no uniform system of analysis had been devel-

oped. He looks forward to a gradual development of physiological standardization along definite and certain lines, and hopes for the official adoption of physiological methods and standards covering all the important drugs and preparation that cannot be assayed by chemical means.—Proc. Ind. Phar. Assoc., 1912, 65-70. (E. C. M.)

Light and Drugs.—An editorial (J. Am. Med. Assoc., 1912, v 59, p. 2160) calls attention to the observation of Neuberg who found that nearly all types of organic compounds acquire a pronounced photosensitiveness when they are mixed with certain inorganic compounds. Iron salts, for instance, provoke this effect most strikingly; and the phenomena of change induced by the presence of such sensitizing substances fail to evince themselves so long as the solutions containing them are kept in the dark. Many familiar drug preparations represent combinations of organic compounds and metallic elements and the obvious outcome of the observations so far recorded by Neuberg and others is that preparations containing metallic components should be preserved in dry form if possible and in any event they should be kept in dark containers and protected against light. (M. I. W.)

Drugs—Deterioration—An editorial (J. Am. M. Assoc., 1912, v. 59, p. 959) calls attention to the gradual spread of the practice to date pharmaceutical preparations and thus safeguard the patient. (M. I. W.)

Vegetable Drugs—Determination of Extractive.—Among the criteria of quality in the case of vegetable drugs containing neither alkaloids or glucosides for their assay, the determination of water, ash and extractive are mainly depended on. Riedel & Co. direct attention to the following new method, which they recommend as being generally available for the extractive determination: "2 Gm. of the finely powdered, air dry substance are introduced into a 250 Cc. Erlenmeyer flask, with 100 Gm. of the menstruum, thoroughly shaken, the total weight taken, and set aside one hour at the room temperature. The flask is then attached to a reflux condenser and the contents heated for two hours to gentle boiling on a water bath or with a small flame on wire-netting. After cooling, the original weight of the flask and contents is restored by the addition of menstruum, the liquid is filtered, and 50 Gm. of the filtrate are evaporated in tared dish, first on the water bath and finally in the drying oven at 105° to constant weight. The number, multiplied by 100, gives the percentage of extract."—Pharm. Ztg., lvii (1912), No. 31, 310; from Riedel's Report, 1912, 42-52.

Vegetable Drugs—Examination with Special Reference to Alcohol and Ether Extracts, and Ash Content.—In the examination of a number of commercial samples of vegetable drugs, J. R. Rippetoe and R. Minor attempted along with tests of identification and for added or accidental impurities to make some assays that would serve as a means of determining the relative value of the sample when compared with some other sample or standard. These assays have consisted chiefly in determining anhydrous extracts, using as menstruum water, alcohol, alcohol and water, ether, chloroform, or petroleum ether, as suggested by the nature of the drug. Some of the drugs included in their report, such as aloes, gambir and gamboge, already have exact standards established by the U. S. P., and the spices, such as capricum and cloves, by the government. The determination of the anhydrous soluble or insoluble matter of a drug, it is true, may not directly estimate its therapeutic value; but in the absence of more reliable evidence it may be of service to the physician, to the manufacturer, and to the chemist in the selection of the drug, as explained by the authors, who fully recognize the fact that a drug may assay high in extractive matter and at the same time contain a low percentage of the principles that give it its chief therapeutic activity.

The Determination of Anhydrous Extract is carried out as follows: Transfer 2 Gm. of the sample in fine powder (or not less than No. 40 powder) to an 8 oz. flint bottle stoppered with a best grade cork. Add 100 Cc. of the menstruum, mix thoroughly and set aside 12 or 18 hours (over night), shake in mechanical shaker for 3 hours and then set aside for a few minutes to settle. Filter through a fluted filter. If the filtrate is cloudy a small quantity of kieselguhr may be of some aid in obtaining a clear filtrate. Transfer 50 Cc. of the filtrate representing 1 Gm. of the drug to a tared 5 oz. breaker, evaporate on water-bath and dry to constant weight at 100° C. If the extract content is high it is advisable to use less of the filtrate. Where the alcohol menstruum used in determining the anhydrous alcohol extract was of a percentage other than 95 per cent. absolute alcohol, the percentage is indicated by the figure in brackets in the table submitted in this paper.

The Determination of Insoluble Matter is effected by collecting on balanced filters, washing with the menstruum until the washings are free from extractive and drying the residue at 100° C.

The Volatile Ether Extract is determined by allowing the 50 Cc. of the filtrate in the tared breaker to evaporate spontaneously and then drying in a vacuum desiccator over sulphuric acid at room

temperature to constant weight. The extract is then dried to constant weight at 100° C. The loss of weight in the last operation is calculated to "volatile ether extract" and the residue in the beaker to "anhydrous ether extract."

Moisture is determined by weighing about 1 Gm. of the sample into a 5 oz. tared beaker or a 3 inch watch glass and drying either at 100° or 105° C.

Ash is determined by igniting in either a platinum or silica crucible, usually platinum, with the aid of a blast.

The results of the assays carried out in this way, representing a large number of drugs and in most cases many samples of them, are given in a table covering 9 pages, specific remarks being made in connection with the assays of the following drugs: Aloes, Benzoin, Cannabis Indica, Colocynth, Guaiac, White Hellebore, Henna leaves, Kino, and Lycopodium.—*Amer. Jour. Pharm.*, Oct., 1912, 433-445.

Nobel Prize.—An editorial (*J. Am. M. Assoc.*, 1912, v 59, p. 1548), points out that the Nobel Prize in medicine for 1912 has been awarded to a member of the staff of the Rockefeller Institute for Medical Research in New York. Alexis Carrel, who brings this honor to American medicine, was born in France in 1873 and graduated as doctor of medicine from the University of Lyons in 1900. Shortly afterward he came to this country and worked for a year or two in the physiologic laboratory of the University of Chicago, where he accomplished remarkable results in the suture of blood-vessels, and began his work on the transplantation of organs. Soon after the opening of the Rockefeller Institute for Medical Research in New York he joined its staff, and it is there that he has done the work for which he now receives the Nobel Prize. (M. I. W.)

Pharmacology and Therapeutics—Problems.—Sollman, Torald, thinks that the chief scientific problem at the present time is undoubtedly the correlation of pharmacology and therapeutics. No one can honestly doubt that the rise of pharmacology or pharmacodynamics—of the scientific experimental investigation of drug action—has played the part of a powerful and predominantly useful ferment in therapeutics. It has not, however, reached the possible maximum of this usefulness. There is still a large field for investigation in scientific pharmacology; but there is also urgent need for pioneer work in applying the results of pharmacology to the problems of the practitioner. This requires not only a willing-

ness to try new things, but also mutual sympathy, understanding and coöperation between clinical and laboratory workers.—J. Am. M. Assoc., 1912, v 59, pp. 833-834. (M. I. W.)

Therapeutics—Improvement.—Miller, Joseph L., in an article entitled, "How May the Science of Therapeutics be Advanced," reviews the recent and former methods of therapeutic study, and calls attention to some of the therapeutic fallacies of the present time. He points out that the therapeutic action of only a limited group of drugs is capable of definite clinical demonstration. The number of these drugs is, however, gradually being increased upon and the outlook is exceedingly encouraging. The therapeutics of today is far in advance of that even of ten years ago. The limitation of drug therapy is better understood and has led to developments along the line of diet, hygiene, etc. Our teachers in medicine are each year growing more conservative and each year will register the elimination of some therapeutic fallacy and herald the acquisition of therapeutic knowledge acquired by scientific investigation.—J. Am. M. Assoc., 1912, v 59, pp. 913-917. (M. I. W.)

The Drugs We Need.—Osborne, Oliver T., in discussing the drugs that we need, points out that the physician could succeed with a remarkably few of the present official drugs. He points out that a thorough knowledge of the pharmacologic activities of some drugs and of the pharmacologic uselessness of other drugs is now necessary in the preparation of the medical student. Having such knowledge, he will not make the mistakes that have long been made in the use of drugs. Osborne believes that instruction in and examination on useless drugs only will be a cure for the mistake of using nostrums, proprietaries, or even absurd and useless pharmacopœial preparations.—J. Am. M. Assoc., 1912, v 59, pp. 1160-1163. (M. I. W.)

Restricted Materia Medica.—Le Fevre, Egbert, in commenting on the desirability of a more restricted materia medica from the point of view of medical instruction, states that no part of the medical curriculum has been more subject to criticism than the teaching of materia medica; the statement is frequently made both by the general practitioner and by members of examining boards that the average medical student is not sufficiently instructed in the science and art of therapeutics, and is especially weak in his knowledge of drugs and their incompatibility and behavior in combinations and in his ability to write prescriptions. The present medical curriculum is by far too extended, so that it is practically impossible for the students to give sufficient time and attention to many

fundamental subjects, because many others of minor importance have been introduced into it. (M. I. W.)

Restricted Materia Medica.—Hynson, Henry P., in commenting on the desirability of a more restricted materia medica from the standpoint of the pharmacist, points out that therapeutic nihilism has had about as much effect on the misuse of drugs as political nihilism has had on the misuse of governmental power. He believes that the enforced, restricted or superficial knowledge of the agents that medical men are using is to be thoroughly blamed for the present unrestricted materia medica, which means an untaught, unlearned and uncertain materia medica accompanied by a reckless and meaningless use of many, if not all, of the materials contained therein.—J. Am. M. Assoc., 1912, v. 59, pp. 1158-1159. (M. I. W.)

Synthetic Remedies: 25 Years.—Dr. A. Eichengruen, in his address as chairman of the Section on medico-pharmaceutical chemistry of the Verein Deutscher Chemiker, at their twenty-fifth anniversary at Freiberg, gave a very interesting account of the evolution of the synthesis of medicaments, which began in 1887 when the constitution of antipyrine was determined, the antifebrile properties of acetanilide were recognized and when the first antipyretic of the aromatic series, namely, phenacetin, was prepared synthetically. (Vide address by Chairman of Historical Section A. Ph. A., at Denver meeting, J. A. Ph. A., October, 1912). The author deplors the fact that up to the present time we have no definite law between chemical construction and physiological action.—Ph. Post, 1912, No. 47, 493. (O. R.)

Useful Remedies.—Wilbert, M. I., reports on the work of the Committee on Useful Remedies, and states that a list has been compiled and agreed upon by the members of the Council on Pharmacy and Chemistry of the American Medical Association, and will be offered tentatively in the form of a manual for ready reference, with the request that American practitioners, generally make such suggestions as will tend to make the final list representative of the best in the materia medica of American medicine.—J. Am. M. Assoc., 1912, v 59, pp. 1163-1164. (M. I. W.)

Obsolete Medicaments.—Dr. Phil et Med., J. Katz, in an excellent paper, which must be consulted for particulars, treats the evolution of the materia medica from the oldest times, to Paracelsus and up to our present days. The history of a number of important drugs is given, as well as the reason of the introduction of some inactive ones by virtue of their *signa naturæ* or the *signatura plantarum*. The improper collecting, drying and curing, as well as the

needed improvement in the preparation of galenicals is also dealt with. The replacement, frequently unjustified, of the drugs and their preparations by their active principles as alkaloids, glucosides, etc., is also mentioned. The author gives the following three reasons why some of the drugs have become obsolete:

1. Their replacement by better and more active medicaments.
2. The discovery that many so-called medicinal drugs have no therapeutic properties.
3. Galenical preparations of many of the vegetable drugs are not properly manufactured.

The latter objections has been overcome in the preparation of homœopathic tinctures by the employment of fresh drugs.—Ph. Zhlle., 1912, No. 33, 913-926. (O. R.)

Mummies as Medicine.—Dr. Reutler gave an address on this topic at the last meeting of the Swiss Pharmaceutical Society. He outlines origin of the unappetizing custom by saying that among the ancients, bitumen of Judea and of Persia was a highly esteemed medicine; that this bitumen was used by Egyptian embalmers for filling the abdominal cavity after the removal of the entrails of the corpse; that after dispoilation of the Egyptian tombs, the mummy bitumen was employed and that eventually pulverized mummy was employed and that finally during the Middle Ages, the mummy itself became lauded as a medicine of supernatural qualities. The paper quotes statements of the medieval medical authorities on the physical and medical properties of mummies and describes Egyptian mummies, white mummies (cadavers of those perishing in African deserts and drying beneath a layer of hot sand) fictitious mummies (prepared by counterfeiterers, from ordinary European cadavers, to simulate the Egyptian product) and lastly honest European mummies, preferably from hanged criminals, along with a recipe for their preparation as published by Becker.—Schweiz. Wschr. f. Chem. u. Pharm., 1 (1912), Nos. 36 and 37, 548 and 562. (H. V. A.)

Candy Medication.—Fantus, Bernard, suggests the use of candy tablets, particularly for insoluble and tasteless substances such as calomel, yellow iodide of mercury, arsenic trioxide, tartar emetic, nitroglycerin, elaterin, and scopolamine. For 100 tablets of a substance whose dose is to be 1-100 grain, each tablet to weigh 3 grains, the following formula may be used:

Active ingredient.....	1 grain
Cacao butter.....	9 grains
Powdered sugar.....	290 grains

Talcum, not to exceed 3 per cent., may be added to prevent sticking of the tablets to the punches. This addition is not necessary when the tablet contains a considerable amount of insoluble powder.

The ingredients are thoroughly triturated and then compressed in the tablet machine. The 3 per cent. of cacao butter, as suggested by Schleimer, admirably serves the purpose of a cohesive agent for prescription quantities of tablets.—J. Am. M. Assoc., 1912, v 59, pp. 842-844. (M. I. W.)

Drugs—Action.—Wallace, George B., discusses the influence of pathologic conditions on the action of drugs, and points out that the assumption drawn from pharmacologic experiments are frequently misleading to the clinician. He points out a number of instances of differences in drug-action in the healthy and diseased animal, and suggests the importance of enlarging on the field of pharmacologic research so as to include a study of the possible variation in the action of potent remedies.—J. Am. M. Assoc., 1912, v. 59, pp. 839-841. (M. I. W.)

Masticulating Agents.—F. Berger gives historic review of various substances used as "masticatoria" by ancients, primitive people and also at present time. He quotes list of chewing agents published by Hahn in 1839, who groups these into those of acrid taste like pellitory and tobacco; burning taste like ginger and mustard seed; aromatic, like cloves and mastic; tonic and astringent, like cinchona and rhatany; and deodorants, like roasted coffee and wood charcoal. He mentions the chewing of cloves by the Chinese since B. C. 220; of mastic by the Mohammedans; of coca by the Peruvians, and then gives special attention to the three great masticatoria used at the present time; tobacco, chicle, and betel nut. Of the latter he gives many interesting details.—Schweiz. Wschr. f. Chem. u. Pharm., 1 (1912), Nos. 26 and 27, 389 and 401. (H. V. A.)

Llujta.—This is the Bolivian name of the alkaline material used by the coca chewers of the Andes, and represents the ash of Chenopodium Quino, coca stems, banana stalks or even burnt lime kneaded with potato (or some other starch) and water and dried.

A sample brought from Bolivia by Dr. Herzog has been examined by Hartwich and Wichmann, who find it in grayish tablet-like pieces about 10 Cm. x 3 Cm. x 4 Mm. in size. The starch as shown under the microscope is from wheat; while qualitative analysis showed presence of potassium, sodium, magnesium, calcium, aluminum, iron, carbonates, chlorides, sulphates, phosphates and silicates. Titration showed an alkalinity of 0.968 per cent. (calculated

as K_2CO_3), while the water insoluble part represented 22.32 per cent. $CaCO_3$.—Schweiz. Wschr. f. Chem. u. Pharm., 1 (1912), No. 26, 392. (H. V. A.)

"Sibucara".—*A Venezuelan Bark of Unknown Botanical Origin*.—Ernest W. Mann and R. E. Griffiths have made a preliminary chemical examination of "Sibucara," a bark of unknown origin from Venezuela. When a little of this bark is masticated it produces a pronounced numbing and tingling of the tongue, with a marked sialagogue effect, the sensation being similar to that produced by cocaine. It contains only a minute trace of alkaloid; a fair amount of a yellowish amorphous matter was obtained, but this was free from the peculiar numbing and sialagogue effects, which appear to be due to some peculiar principle present in a greenish oily substance extracted from the alcoholic extract by ether.—Pharm. Journ. and Pharmacist, Feb. 24, 1912, 260.

Anæsthetics—Statistics on Fatalities.—Gwathmey, James T., reviews the American statistics on anæsthesia fatalities and points out the difficulties of securing reliable data.—J. Am. M. Assoc., 1912, v 59, pp. 1844-1846. (M. I. W.)

Anæsthetics—Postoperative Mortality.—Miller, Albert H., in discussing postoperative mortality from anæsthetics, points out the difficulty of recognizing fatalities that are entirely independent of the anæsthetic and those in which the anæsthetic is a contributing factor. He also states that, at the present time, only a small proportion of the deaths from anæsthetics are reported and it is impossible to determine accurately the total number of administrations.—J. Am. M. Assoc., 1912, v 59, pp. 1847-1848. (M. I. W.)

Anæsthetics—Chemistry of Inhalation.—Baskerville, Charles, reviews the several papers that he has recently published on the chemistry of inhalation anæsthetics and outlines standards and tests for nitrous oxide, ethyl ether, chloroform and oxygen. He points out that, while idiosyncrasy has served to account in large part for untoward after-effects of anæsthetics and certain disagreeable consequences, as nausea, and interferences with some of the normal organic functions, these may now largely be obviated, and in many cases entirely avoided, by the use of anæsthetics that are free from impurities, and by improved methods of administration. He also states that the main objectionable constituent in ether is acetaldehyde, the generation of which can be avoided by keeping the ether free from water. Anæsthetic chloroform should contain ethyl alcohol, but the conditions of transportation and keeping should be such

as to reduce the change of alcohol to aldehyde and acetic acid to the minimum. Nitrous oxide which is to be used for anæsthesia should contain at least 95 per cent. of N_2O and no solids, liquids, combustible organic matter, chlorine, or other oxides of nitrogen.—J. Am. M. Assoc., 1912, v 59, pp. 1837-1841. (M. I. W.)

Poisonous Food Materials.—Sedgwick, W. T., in discussing the fallacy of testing food materials by animal inoculation, asserts that this test is irrelevant and unnatural, and can in no sense prove that if the substance were taken through the mouth, it would be either harmful or innocuous.—J. Am. M. Assoc., 1912, v 59, pp. 1509-1511. (M. I. W.)

Antidotes—Suggestion of Official Table.—Otto Raubenheimer suggests that a Table of Antidotes, similar to that of the Netherlands Pharmacopœia, should be added to the United States Pharmacopœia.—Proc. N. Y. Phar. Assoc., 1912, p. 324. (E. C. M.)

Antitrypsic and Meiotagmic Reactions.—M. C. Delenze explains these two types of modern diagnostic tests. The first is based on the fact that while the trypsin of normal serum readily converts caseine into a form which will not precipitate with acids, the sera of cancerous patients does not thus affect alkaline caseine solutions.

The meiotagmic reaction is a comparison of the surface tension (as expressed in number of drops of fluid to a certain volume) of mixtures of the antigens on one hand and the anticorps on the other; the first being extracts from the diseased tissue while the latter are usually blood sera. The reaction is of service in diagnosis of syphilis, typhoid fever and tuberculosis.

The article gives details of manipulation of both reactions.—Schweiz. Wschr. f. Chem. u. Pharm., 1, (1912), No. 13, 182. (H. V. A.)

Idiosyncrasy and Anaphylaxis—Possible Relation.—An editorial (J. Am. M. Assoc., 1912, v 59, p. 200) points out that with the discovery of the phenomenon of anaphylaxis or allergy, attention was early called to the similarity between the anaphylactic symptoms and the symptoms of many so-called idiosyncrasies; and it was at once suggested that we had here an explanation of this hitherto mysterious toxic action of substances ordinarily not injurious. While the anaphylactic theory of drug idiosyncrasies has been seriously questioned, there is still a possibility of anaphylaxis being in part at least responsible for the production of the symptoms that have been observed.—(M. I. W.)

Infantile Paralysis.—An editorial (J. Am. M. Assoc., 1912, v. 59, p. 1627) calls attention to an article by Anderson and Frost (Public Health Reports, Oct. 25, 1912, p. 1733) who have been able to confirm the observations reported by Rosenau that the stable-fly, *Stomoxys calcitrans*, is an important agent in the distribution of poliomyelitis. (M. I. W.)

Poliomyelitis—Transmission.—An editorial (J. Am. M. Assoc., 1912, v. 59, pp. 1380-1381), reviews some of the recent work on poliomyelitis, and calls attention to the observations of M. J. Rosenau which indicate that the stable-fly, *Stomoxys calcitrans*, plays an important part as a transmitter of this disease. The discovery that the stable-fly is an important agent in transmitting the disease will make it a comparatively easy matter to prevent infection and to open an avenue for the eventual control of this dread disease. (M. I. W.)

Primula Dermatitis.—H. A. Sharpe (J. Am. M. Assoc., 1912, v. 59, pp. 2184-2194) reports 4 cases of primrose dermatitis caused by the flowers of the wild primrose, *Primula farinosa*, Linné, which grows wild throughout the southern part of Wisconsin, Minnesota, Michigan and northern Illinois. (M. I. W.)

Typhoid Fever.—Weston, Paul G., reports the immunization against typhoid of 898 patients in the State Hospital for the Insane, Warren, Pa., and describes the technique that was employed.—J. Am. M. Assoc., 1912, v. 59, pp. 1536-1537. (M. I. W.)

Antityphoid Inoculation.—Separate papers by Lesly H. Spooner, F. F. Russell, and Hachtel and Stoner, report practical experience with the use of antityphoid inoculation in schools for nurses, in the U. S. Army, and in public institutions. Russell presents a table showing the decrease in typhoid fever in the U. S. Army following antityphoid vaccination. The ratio of cases of typhoid per thousand mean strength has decreased from 6.74 in 1901 and 6.99 in 1902 to 0.82 in 1911, and an estimate of 0.20 in 1912.—J. Am. M. Assoc., 1912, v. 59, pp. 1359-1360. (M. I. W.)

State Board Examinations.—Le Fevre, Egbert, has analysed a total number of 2,409 state board questions and found that they asked questions on 510 drugs. One hundred and twelve questions were asked on 31 comprehensive topics, such as anodynes, anthelmintics, antipyretics, carminatives, cathartics, cholagogues, counter-irritants, deoderants, dipilatories, escharotics, ecobolics, galactagogues, parasitocides, refrigerants, sialagogues, styptics, etc.—J. Am. M. Assoc., 1912, v. 59, p. 1159. (M. I. W.)

Pharmacists—An Opportunity.—An editorial (J. Am. M. Assoc., 1912, v. 59, pp. 560-561) comments on an article published in N. A. R. D. Notes, July 4, 1912, p. 813, in which the pharmacist is admonished to avoid counter prescribing and to restrict himself strictly to the legitimate sale of drugs. The advice given, if followed by the pharmacist, is bound to bring added protection to the public and credit to pharmacy. (M. I. W.)

Medical Education.—An editorial (J. Am. M. Assoc., 1912, v. 59, pp. 650-654), reviews the report of the Council on Medical Education for the year ending June 30, 1912, and presents a number of tables showing the number of students in attendance and the number of graduates from the several medical colleges during the years 1880 to 1912, inclusive. It also presents a table showing the number of colleges closed since 1904. Of the 65 medical colleges which have ceased to exist, 37 were closed by merger, and 28 became extinct. While the total number of colleges is growing smaller and approaching more nearly the normal supply for the country, it is encouraging to note that the number of high-grade, stronger colleges is constantly increasing. In 1904, only four medical colleges were requiring any preliminary education in advance of the usual high school education; now there are forty-five requiring one or more years of advance college work. The total number of medical colleges in the United States at the present time is 116, a net reduction of 50 from the maximum in 1904. (M. I. W.)

Materia Medica—Teaching.—Stewart, F. E., believes that it would be a great advantage to those who are teaching materia medica if they could limit the Pharmacopœia to really useful drugs. But unfortunately there is such a difference of opinion among therapeutists that it would be difficult to accomplish.—J. Am. M. Assoc., 1912, v. 59, p. 1164. (M. I. W.)

Materia Medica—Teaching.—Hare, Hobart A., thinks that half the number of hours that are devoted to lectures on materia medica could be more advantageously employed if there were no state boards, because at the present time teachers are forced to teach facts which will not be used in practice merely because they will be used in state board examinations.—J. Am. M. Assoc., 1912, v. 59, p. 1165. (M. I. W.)

Biologics—Their Specificity.—W. F. Richter contributes an interesting paper on "Biologics, Their Specificity," in which he says:

"In some diseases, such as diphtheria and tetanus, the causative organisms remain at the point of introduction into the body. The diphtheria bacillus remains localized in the 'patch.' During their growth they elaborate very potent toxins or poisons which are carried to the various tissues of the body upon which each exerts its particular action, producing a symptom complex characteristic of the disease. It is probable that in these cases the body not only forms substances antagonistic to the existence of the bacteria, but also substances that have a neutralizing effect upon the toxin. By isolating these toxins and injecting them into animals, large amounts of these toxin neutralizing bodies (anti-toxins) are produced. Here again these substances show a true specificity in that the serum of animals immunized against diphtheria toxin will neutralize only diphtheria toxin and not tetanus toxin. Likewise, tetanus antitoxin will only neutralize tetanus toxin."

The lower animals are immune to syphilis, typhoid fever and other diseases which affect mankind, and fowls are able to withstand many times the quantity of tetanus toxin that would kill a horse. Yellow fever rarely occurs in the negro race. Such insusceptibility is termed inherited immunity. In contradistinction to this form is acquired immunity (which may be either natural or artificial). He describes the methods of acquiring the latter immunity, both active and passive, describes vaccines and serums and calls particular attention to the fact that failure in many cases to cure, may be due to lack of proper selection of the bacterial vaccine or serum.—Proc. Idaho Pharm. Assoc., 1912, pp. 29-34. (E. C. M.)

Medicinal Plants—Cultivation.—Dr. Kurt Siegfried gave a lecture on this topic before the Swiss Apotheker Verein, outlining work done on this line in other countries, amount of drugs imported that might be raised in Switzerland, and closing with some suggestions as to drug raising in general.—Schweiz. Wschr. f. Chem. u. Pharm., 1 (1912), No. 46 and 47, 689 and 70. (H. V. A.)

Pharmacopæial Plants of Maryland, etc.—Prof. Charles C. Plitt, of the University of Maryland, makes an analysis of the sources of the articles included in the Pharmacopœia and finds that 638 of them are of botanical origin and urges pharmacists to take more interest in that side of their profession, declaring that they will be more than repaid in the pleasure derived from the study.—Proc. Md. Pharm. Assoc., 1912, pp. 94-98. (E. C. M.)

B—VEGETABLE DRUGS

(Arranged in the order of their Botanical Source.)

ALGÆ.

Agar-Agar—Manufacture.—Six kinds of seaweed are used in the preparation of agar-agar. After crushing and washing and bleaching by the action of sun, frost and dew during September and October, whereby the weight is decreased one-half, the seaweed is mixed in the following proportions: Izu 4, Egokusa 4, Nanbu 4, Misaki 3, Hirakusa 3 and Onikusa 2. After cooking for about 14 hours, the hot liquid is strained, and after having partly solidified, is cut into strips or pushed through a sieve whereby the customary stringy pieces are produced.—U. S. Consular Report. (O. R.)

Agar—Microscopical Determination in Jams, Jellies and Similar Fruit Products—Improved Method.—In place of the customary ashing or ashing-acid methods, Albert Schneider finds it more satisfactory to dissolve about 10 Gm. of the substance in 200 Cc. of distilled water and centrifugalize for half an hour; decant the supernatant liquid and examine the residue microscopically. If agar has been present, characteristic agar diatoms, undissolved agar cell fragments and remnants of undissolved parasitic algal forms are found. If the usual ashing or ashing-acid process is used, no matter how carefully, many of these characteristic diatoms are comminuted and destroyed. One or more diatoms and one or more algal remnants in one ordinary slide mount (or 5 to 20 fields of view) is conclusive evidence that agar has been added but it is not possible to determine accurately the amount present. It is essential that only distilled water be used making the examination.—Pacific Pharmacist, June, 1912, 35-36. (C. M. S.)

BACILLARIÆ.

Bacteria—Practical Method of Producing Culture Media and Counting.—Dr. H. Kühn, as the result of a comprehensive study, communicates accurate instructions for preparing various culture media and describes in detail several practical methods for counting the bacteria adapted for the examination of liquid and solid objects containing them.—Pharm. Ztg., lvii (1912), No. 56, 563; from Ztschr. f. Öffent. Chem., 1912, No. 10.

FUNGI.

Fungi—Influence of Heat on Their Hæmolitic Power and Toxicity.—The hæmolytic power of fungi is attributed by the

authors in great part to a glucoside. J. Parisot, however, finds that while *Amanita phalloides* has undoubtedly very considerable hæmolytic power, this property is found also in most poisonous fungi and even in the edible varieties, but that, generally speaking, heating weakens the hæmolytic power and, at the same time, diminishes the toxicity of fungi.—Pharm. Journ. and Pharmacist, Dec. 21, 1912, 781; from Journ. de Pharm. et Chim., Nov. 16, 1912, 476.

Aspergillus Niger—*Extraordinary Sensitiveness to Manganese*.—G. Bertrand has previously shown that a small amount of manganese in culture media is very favorable to the growth and formation of conidia by *Aspergillus niger*. Further experiments show that the mould is extraordinarily sensitive to the influence of this metal in infinitesimal amounts. The beneficial effect of as little as one part of manganese in 10,000,000,000 is stated to be distinctly evident. That a living organism should be definitely affected by such a minute trace of an active substance has an important bearing on biological researches. Not only may cultures be influenced by traces of substances far beyond the present methods of chemical analysis, but physiological and pathological conditions may be affected; and more complex substances than metals and their salts may have a similar marked influence. Also results which have been attributed to certain chemicals may not have been due to these, but to minute traces of some impurity. Thus, the purest commercial ferrous sulphate may contain from 0.2 to 0.5:1,000 of manganese. The use of a few tenth or hundredths of a milligramme of such a salt would give results attributed to the iron, which would in reality be due to the manganese.—Pharm. Journ. and Pharmacist, April 6, 1912, 543; from Compt. rend., 154 (1912), 616.

Yeast—*Presence of an Alkaloidal Curative Substance which Prevents Polyneuritis*.—It has previously been shown by C. Funk that "rice-polishings" contain a substance which prevents polyneuritis, and this substance has been isolated in a more or less pure crystalline state, the provisional formula $C_{17}H_{26}N_2O_7$ being attributed to it. The author has since examined yeast, which is known to possess similar curative action, and has isolated from it the same substance, to which he has given the name

Vitamine.—It is, however, accompanied by pyrimidine bases and other substances, to eliminate which hydrolysis and fractional precipitation are necessary; consequently the yield of pure vitamine is very minute. Nevertheless, vitamine is undoubtedly the sole curative agent in yeast, and in "rice-polishings," and a large number of cures of pigeons affected with polyneuritis have followed the

administration of 2 to 4 centigrammes. Vitamine probably belongs to the pyrimidine group; the aqueous solution of the base is neutral and does not react with acids. When recrystallized from diluted alcohol it melts at 233° C.—Pharm. Journ. and Pharmacist, Oct. 12, 1912, 455; from Brit. Med. Journ., 1912, 2, 787.

Swiss Ergot of 1911.—A. Vatter gives the following data. Ergot is found most abundant on dry and sunny places 700 to 900 meters above sea level. That on winter rye is small and more uniform than on summer rye. Swiss ergot of 1911 was of excellent strength, running from 0.16 to 0.220 per cent. alkaloids by the Keller assay. The therapeutical action of the fluidextract from 1911 ergot was better than that of the harvest of 1910.—Schweiz. Wschr. f. Chem. u. Pharm., 1., (1912), No. 25, 377. (H. V. A.)

Swiss Ergot of 1911—Quality.—C. Hartwich describes the ergot collected in the Canton of Luzern in 1911 and states that the dry summer produced unusually large sclerotia, some specimens measuring as much as 7.7 Cm. The last Swiss Pharmacopœia directs rejection of all ergot longer than 25 Mm. and that on the presumption that small ergot is richer in alkaloid than is the large. Assay of the large ergot of 1911 showed 8.41 per cent. water, 15.48 per cent. fat, 2.68 per cent. ash and 0.096 per cent. alkaloid. While this alkaloidal content is less than the average of commercial ergot.—e. g. Cæsar & Loretz's figures of 1906, 0.027 to 0.364 per cent.—Keller's figures of the Swiss ergot of 1893 showed an alkaloidal content of 0.095 per cent.—exactly that of the large ergot of 1911—this seeming to show that size did not affect alkaloidal strength.

In the crop of 1911, were found sclerotia that were yellow white, which even spectroscopic examination showed absolutely devoid of the violet coloring matter sclererythrine. This bleached ergot has been called by the collector, Dr. Sidler, *leuco sclerotium*, and while amount collected was insufficient for an assay, superficial examination gave distinct evidence of alkaloid. The paper concludes with reference to the description of Swiss ergot and illness produced by ergotmized rye given in a book of 1717 and the fact that the common name of ergot in Switzerland is "Wolff-Zähne," "Roggenbrand" and "Turf," the German "Mutterkorn" not being used by the German speaking peasants of Switzerland.—Schweiz. Wschr. f. Chem. u. Pharm., 1., (1912), No. 19, 281. (H. V. A.)

Ergot—A New and Reliable Method for the Preservation of Ergot Preparations.—Paul S. Pittinger and Charles E. Vanderkleed in a series of experiments extending over a year, the results of

which are given in accompanying tables, suggest that by the adoption of the Vacuum method of storing ergot preparations their stability may be retained for a considerable length of time.—Proc. Penn. Phar. Assoc., 1912, pp. 128-133. (E. C. M.)

LICHENES.

Cudbear as a Pharmaceutical Coloring.—George M. Beringer traces the history of the use of Cudbear as a coloring agent in pharmaceutical preparations and calls attention to the necessity of standardizing in some simple manner the tincture prepared from *Lecanora Tartarea*. He discusses the various methods proposed for forming color-standards, the color-chart, colored yarns and threads, glass and standard glass rods, all of which he declares impracticable for use in pharmacy. A more promising line of work has been the attempt to standardize dilutions of cudbear tinctures against solutions of definite strength and color such as solutions of iodine, solution of gold tribromide or an alkalized phenolphthalein solution, the latter a suggestion of Mr. Otto Raubenheimer. He approves the opinion of Chairman Diehl "that any other than the simplest method of standardization will prove disastrous since it is not likely to be carried out by the average pharmacist." He advocates, owing to the common adulteration of cudbear with sodium chloride, that all cudbear used for pharmaceutical purposes should be washed with at least five times its weight of cold water, this treatment removing most of the sodium chloride, some ammonium salts with their empyreumatic odor, as well as some organic products which are undesirable and says that the washed cudbear is more readily extracted and loses scarcely any of its real tinctorial power.

In order to make comparisons of different tinctures he prepared eight tinctures by differing menstrua and states the results of these experiments in the following table:

No.	Formula	Army Orcin Standard	Raubenheimer Standard Phenolphthalein Pink Solution	Beringer Modification	To color 100 Cc. Aromatic Elix.
1—National Formulary III.		3. Cc. after adding 3 drops NH_3 (1%).	2.4 Cc. after adding 5 drops NH_3 (1%).	2.2 after adding 5 drops NH_3 (1%).	1. Cc.
2—Hankey's Recipe.		2 Cc. after adding 2 drops NH_3 (1%).	1.7 Cc. after adding 3 drops NH_3 (1%).	1.5 Cc. after adding 2 drops NH_3 (1%).	.8 Cc.
3—Menstruum—Diluted Alcohol.		1 Cc. after adding 2 drops NH_3 (1%).	.8 Cc. after adding 2 drops NH_3 (1%).	.6 Cc. after adding 4 drops NH_3 (1%).	.3 Cc.
4—Menstruum—Alcohol 3 vols., water 1 vol.		.8 Cc. Tint not well matched.	.5 Cc. after adding 2 drops NH_3 (1%). Difficult to match exactly.	.5 Cc. after adding 2 drops NH_3 (1%) not exactly matched.	.2 Cc.
5—Menstruum—Alcohol.		1. Cc. Dilutions cloudy and difficult to match exactly by addition of NH_3 .	.65 Cc.	.65.	.22 Cc.
6—Menstruum — Stronger Ammonia, water 25 Cc., alcohol 975 Cc., finish with alcohol.		1.2. Dilution too purple and comparison approximate only.	.8 Cc.	.9 Cc.	.25? Cc. not same tint.
7—Menstruum—Ammonia water U. S. P. 1 vol. Water, 3 vols. percolate 4000 Cc. Evaporate to 750 Cc. When cold add alcohol 250 Cc. and water q. s. to make 1000 Cc.		.8 Cc.	.57 Cc. a good match.	.6 Cc. a good match.	.2 Cc.
8—Mix the cudbear with hydrochloric acid 25 Cc., allow to dry and then percolate with alcohol to 1000 Cc.		.5 Cc. after adding 4 drops NH_3 (1%).	.5 Cc. after adding 4 drops NH_3 (1%).	.5 Cc. after adding 4 drops NH_3 (1%).	.2 Cc.

While these experiments do not permit of the exactness of determinations made by chemical analysis they do permit the following deductions that the present N. F. formula gives the poorest preparation and that the formula proposed for the revision is not the best that can be devised. If the N. F. is to adopt a formula in which the extraction is to be made with ammonia water then formula No. 7 is to be commended and if alcoholic extraction is to be the basis of the official formula then formula No. 4 should be approved. Regarding No. 8 formula he says that the results indicate a method of using cudbear where a trace of acid is not contraindicated.

By a series of experiments he concludes that orcein must have a limited use in pharmacy and that it could not displace cudbear with satisfaction.

From his experiments in the preparation of extract of cudbear he opines that the use of this extract would very materially reduce the variability in color in preparations in which it was used and that it would also be available for the preparation of a more uniform tincture.—Proc. New Jersey Pharm. Assoc., 1912, pp. 56-71. (E. C. M.)

FILICES.

Manna-Fern (Lecanora esculenta)—The "Biblical" Manna.—In an article contributed by Ch. Rolland he says that the "manna fern"—the "manna of Biblical history"—is used in Persia not only as a nutrient, but also as an effective lactagogue, under the name of "Chirzade," in daily doses of 150-200 Gm., by women who are weakened by frequent childbirth or by malnutrition. This fern rapidly develops after heavy rains from a dry structural condition to wart-shaped, light, white, internally mealy formations, which are consumed by man and animals as a welcome food. This development is so rapid that the assumption of the wandering Israelites that the "manna has fallen from heaven" is easily explained. The nutrient value of this fern (*Lecanora esculenta*) is apparently due to a content of 20 to 25 per cent. of lichenin. It is stated in Kerner von Marilaun's "Pflanzenleben" that the fern is distributed over an enormous territory in Asia, extending its area to southeastern Europe and northern Africa. It forms at first thick, furrowed, warty encrustations upon rocks, preferably on small limestones, has superficially the color of a mixture of grey and ochre-yellow, the fracture showing a pure white resembling the interior of a crushed grain of wheat. By age the crusts become fissured, become detached from the rocks, and are carried off by wind and rain in the form of

conglobate or warty aggregations of about the size of a filbert. When these find lodgement eventually, they are rejuvenated by the rains and renew their growth. During years of famine the manna-fern is a welcome substitute for grain, and like this is consumed after grinding in form of bread.—Pharm. Ztg., lvii (1912), No. 23, 232; from Bull. Commerc., 1912, No. 1.

GRAMINACEÆ.

Arundo Pseudodonax—*A Giant Cane Indigenous to Northern Germany*.—Dr. T. Græber directs attention to a giant cane growing on the banks of the Lausitz, which is restricted to a small locality along the stream, between two villages in Northern Germany. The plant has been identified by Rabenhorst as *Arundo pseudodonax* and, attaining an average height of 7.2 meters and growing luxuriantly, it forms a giant wall bordering the creek for a short distance. The occurrence is singular, considering the far northern locality of its growth, and the question arises whether it may not serve well to make cultivation experiments with the object of utilizing the large canes for a variety of technical purposes for which the canes from oriental countries are now used.—Pharm Ztg. lvii (1912), No. 65, 656.

Elephant Grass—*A New African Fodder Grass*.—A new fodder grass described as "Zinyamunga" or "Napier's fodder," in Rhodesia, has been identified at Kew as

Pennisetum purpureum, Schum. (*P. Bentharii*, Steud.), a species of very wide range in tropical Africa. It is described by O. Stapf as a tall perennial grass with a creeping rhizome, and as being widely distributed throughout Africa. Both cattle and horses eat it readily, and it is expected to prove of considerable value for winter feed, comparable to maize stalk roughage. Analyzed in a partly dried condition, it was found to contain: Water, 55.33; ether extract, 0.84; proteins, 3.10; carbohydrates, 21.15; fiber, 15.66; ash, 3.71; total=100.00. It is a hearty plant, suitable for planting on light, dry soil.—Pharm. Journ. and Pharmacist, Oct. 19, 1912, 487; from Kew Bull., No. 7, 1912, 309.

"*Rice-Polishings*"—*A Remedy for Beri-Beri*.—In a paper on the prevention and cure of beri-beri, reference is made to the fact that rice is rendered harmful by the milling and polishing process to which it is subjected, resulting in the removal from the grain of some substance of high physiological importance, the absence of which results in the production of polyneuritis in fowls and of beri-beri in man when a diet is consumed of which polished rice is the

staple. Drs. H. Frazer and A. T. Stanton observe that an attempt has been made to prepare a remedial agent from these polishings, since good results have been seen in cases treated by extracts prepared from the polishings. It has been found that the active substance is soluble in water and in 91 per cent. alcohol, the latter solution retaining its activity for months. Accordingly, an

Extract of "Rice Polishings" (more properly designated a fluid or liquid extract; Rep.) was prepared as follows: Sifted polishings were freed from fat by percolation with petroleum ether, and dried in the air; then 1 part of the fat-free material was macerated for a week in 4 parts of 94 per cent. alcohol acidulated with 0.3 per cent. of hydrochloric acid, filtered, the filtrate nearly neutralized with sodium carbonate, again filtered, and the filtrate concentrated to a small volume under reduced pressure, at 60° C. A little water was added, and residual fat removed with petroleum ether; whereupon the new fat-free product was concentrated to near dryness (below 60° C.), and the residue dissolved in water and alcohol in such proportion that the final product contained 50 per cent. of alcohol and 1 Cc. represented 10 Gm. of the fat-free polishings. With this extract the curative and prophylactic properties of the "rice-polishings" was proved.—Pharm. Journ. and Pharmacist, Oct. 26, 1912, 519; from Lancet, Oct. 12, 1912, 1005.

PALMACEÆ.

Structure of Panama Hat Fibers.—The fibers are from the leaves of *Carludovica palmata* and is found on the banks of the Rio Yapacani in Bolivia. Hartwich reports microscopical structure of these fibers, illustrating article with four figures.—Schweiz. Wschr. f. Chem. u. Pharm. 1. (1912), No. 32, 481. (H. V. A.)

LILIAEÆ.

Natal Aloes—Homonataloin a Constituent, and its Constitution.—Klaverness having been unable to find E. Leger's homonataloin in Natal aloes, the latter has reinvestigated the subject, with results that confirm the occurrence of at least two aloins, one of them being homonataloin, the other nataloin. The crude aloins obtained by macerating the aloes (of known origin) in acetone or in 90 per cent. alcohol, were separated by fractional crystallization from 60 per cent. alcohol, the least soluble of the two in that solvent being homonataloin. Yielding arabinose-*d* on hydrolyzation with acid, it would seem probable that homonataloin is a condensation product of this sugar with nataloemodin, but the combustion results do not support this theory. It can be positively stated, however, that the

nataloins contain a methylantraquinone in their molecules: either a dioxymethoxymethylantraquinone or else nataloemodin and arabinose-*d*, and that the molecule is very unstable.—Pharm. Journ. and Pharmacist, Oct. 5, 1912, 421; from Journ. de Pharm. et Chim., 1912, 6, 241.

Cevadilla Seeds—Estimation of Alkaloids.—Th. Ryden finds that the amount of alkaloids in cevadilla seeds varies considerably. The assay process of the Swiss Pharmacopœia is rapid, but gives low results and the end-point is not easy to determine. The content of alkaloid given in the Swiss Pharmacopœia, 3.5 per cent., is too high; 3 per cent. is considered a more correct value. The method of assay used by the author is the following modification of Keller's process: Ten grammes of the powdered drug are shaken for half an hour in a 200 Cc. flask with 100 grammes of ether; 10 grammes of 10 per cent. ammonia solution are then added, and the mixture shaken vigorously and often during two hours. The addition of water is not necessary, as the ethereal solution clears readily on standing. The clear ethereal solution is decanted through a plug of cotton-wool and 50 Cc. are evaporated down to 10 or 15 Cc. This concentrated solution is then shaken in a separator first with 15 Cc. of N/HCl, then with successive quantities of water, until 0.5 Cc. of the aqueous liquid no longer gives a precipitate with Mayer's reagent. This reagent gives a precipitate with a 1 in 20,000 solution of veratrine. Three shakings are usually sufficient. The acid solution is then made alkaline with 33 per cent. solution of sodium carbonate, and shaken, first with 25 Cc., then with quantities of 10 Cc. of ether until no more alkaloid is extracted. The ether is removed by evaporation, and the mixture of alkaloids dried to constant weight. The residue may also be titrated with N/10 HCl using iodeosin as indicator, 1 Cc. N/10 HCl=0.05984 gramme of alkaloids.—Pharm. Journ. and Pharmacist, March 16, 1912, 353; from Svensk. Farm. Tidskrift, 1912, No. 2.

Solomon's Seal—Proximate Examination of the Fruits.—Ernest A. Rayner reports the results of a proximate examination of the berries of Solomon's Seal (*Polygonatum biflorum*), picked at Saginaw, N. C., in the summer of 1910. These berries, when dried, resembled huckleberries in size and appearance. The outer husk is relatively small, the main part of the berry consisting of a cluster of about ten small, round, hard, and very tough seeds. The analysis showed them to contain: Sugars (glucose and a trace of fructose), 12.48 per cent.; oil (mainly ricinolate), 2.00 per cent.; nitrogen, 1.88

per cent.; ash (SiO_2 , Fe_2O_3 , Al_2O_3 , CaO , MgO , K_2O , Na_2O , P_2O_5 , SO_2), 2.27 per cent.; other substances, cellular tissue, water, 81.37 per cent.—Chem. News, June 21, 1912, 289-290.

BROMELIACEÆ.

Agave Fibre—Conversion into Imitation Horse Hair.—A patent has been taken out in France for the preparation of imitation horse hair from "esparto" or cleaned agave. It is obtained by digesting 100 kilos of this material for six hours under a pressure of three atmospheres, with a solution consisting of 23 liters of caustic soda of 36° B. and 1500 liters of water. After rinsing, the fibres are steeped for fifteen minutes in a bath containing 1 liter of sulphuric acid per 100 liters of water; they are then washed, dried, and put through a carding machine. The "hair" may be bleached by means of a solution of bleaching powder (6 Gm. per liter); while curly fibres are obtained by steeping the degummed fibres in a solution of caustic soda at 18° B. for about an hour.—Pharm. Journ. and Pharmacist, July 27, 1912, 111; from Journ. Soc. Chem. Ind., April 30, 1912, 381.

Ananas Sativa—Analysis of the Fruit and Plant.—E. V. Flack, government analyst, has subjected pineapples and the plant grown in the Bathurst District of the Cape Colony, to proximate analysis, with the following results:

	Fresh Fruit per cent.	Fresh Plant per cent.
Moisture	83.86	21.45
Crude fat.....	1.11	0.47
Proteins	0.49	0.75
Crude fibre.....	0.33	3.25
Nitrogen-free extract.....	13.51	12.02
Ash	0.70	2.06
Silica	0.069	1.12
Lime	0.047	0.121
Potash	0.358	0.356
Phosphoric oxide.....	0.024	0.029

The pines were grown in a sandy loam overlying gravel.—Chem. News, March 1, 1912, 99.

IRIDEACEÆ.

Saffron—New Adulterant.—The French expert, Eugene Collin, sent a sample of crocus from Tyrol which, according to his analysis, was adulterated with flowers of *Cynara cardunculus* or *Cynara scolymus*, colored with an azo dye, to Prof. Jos. Moeller, of the pharmacognostic institute of the University of Vienna. Dr. R. Wasicky

found that the adulterant consisted of flowers of *Onopordon acanthium*, which were loaded with barium sulphate and colored with a dye, soluble in water but insoluble in benzin. The article is profusely illustrated and should be consulted for particulars.—Ph. Post, 1912, No. 44, 462-464. (O. R.)

Saffron—Examination of Adulterated Specimens.—Gallois reports the results of a chemical examination of three samples of saffron marketed under the designations respectively of: "Callidad 4," "D 5491," and "Courant." All three were readily pulverizable; the first two were bright red, the last named was artificially colored. The reaction of No. 1 and No. 2 with sulphuric acid was similar to that of genuine saffron, while No. 3 at first became violet, then rapidly reddish-yellow. In the order mentioned, the three saffrons contained 76.6, 77.2 and 62.7 per cent. of moisture; genuine saffron 15.4 per cent.; the residues of evaporation of a hot aqueous extraction was 19.9, 11.0 and 23.5 per cent.; genuine saffron yielded, 35.3 per cent. All three samples burnt readily when inflamed, melting slightly, due to a nitre content, the ash amounting to 36.8, 33.0, and 38.1 per cent. respectively, while genuine saffron yielded only 5.5 per cent. of ash—the ash of the three adulterated samples being composed almost exclusively of borax. Under the lens, No. 1 was shown to consist of saffron, No. 2 a mixture of saffron and stamens, and No. 3 a mixture of saffron with stigmas and stamens in equal proportion. The glucose content of the adulterated samples was: No. 1, 6.1 per cent., No. 2, 7.37 per cent., and No. 3, 5.8 per cent.—genuine saffron containing 21.0 per cent. The author concludes from the data obtained that "Callidad 4" was adulterated to the amount of about 70 per cent.; "D. 5491," 65 per cent., and "Courant," 78.4 per cent.—Pharm. Ztg. lvii (1912), No. 16, 155; from Journ. de Pharm. et Chim., 1912, No. 1.

Saffron—Available Constants for its Valuation.—Else Nockmann in an interesting contribution describes a series of experiments undertaken for the purpose of establishing, if possible, constants for the recognition of genuine saffron and differentiation from the adulterated drug. As shown by the researches of Pfyl and Scheitz, saffron contains a number of substances capable of reducing copper solution, and it seemed important to determine whether the total quantity of these substances present in different samples of genuine saffron, when examined under identical conditions, bear a close relation to each other. If so, an increase of these numbers, accepted as constants, would point to the presence of added saccharine matter.

The possibility of this was confirmed by the experiments, which were carried out with seven different samples of genuine saffron, as follows:

Five Gm. of the saffron were extracted by percolation with distilled water until the percolate (amounting to 200-250 Cc.) passed completely colorless. The percolate was transferred to a 500 Cc. flask, and filled to the mark with the rinsings and sufficient water, then vigorously shaken. In 100 Cc. of this liquid (=1 Gm. saffron) the extract was determined by evaporation and drying to constant weight in a platinum dish; and in portions of 50 Cc. each, the amount of reducing substance was determined by Meissl's method: (1) before inversion; (2) after preliminary inversion, by boiling with hydrochloric acid; (3) by prolonging the inversion for one, three and four hours respectively. The results are shown in the table, which exhibits also the percentages of water and ash in the original drug, the figures of invert sugar and aqueous extract being based on the dry substance:

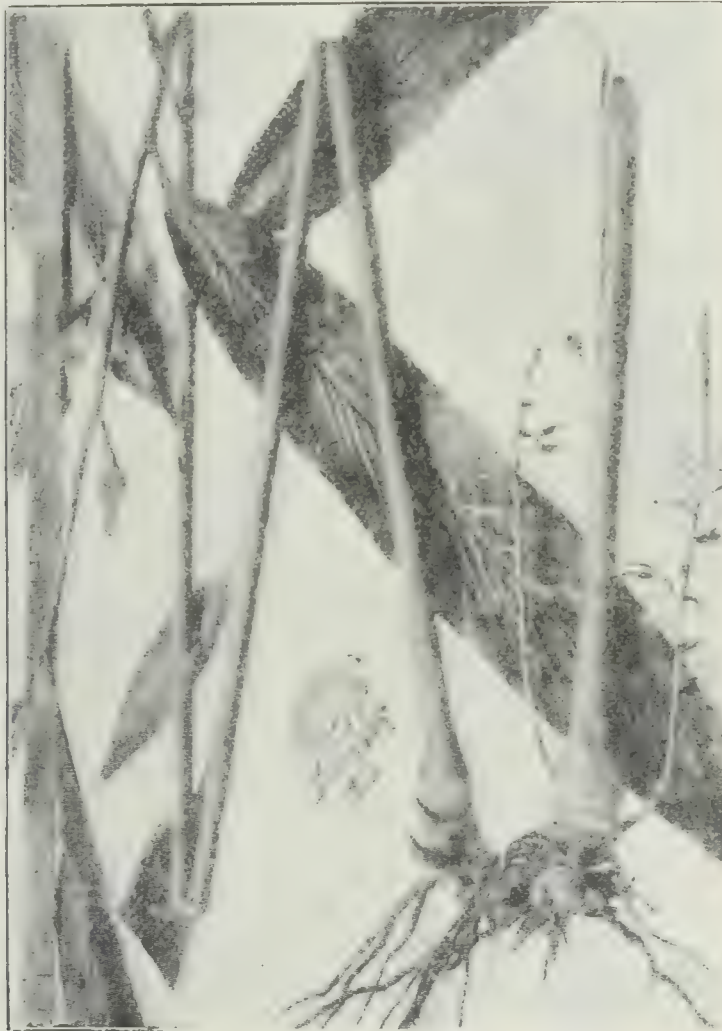
Sample		Original Drug		In the Dry Substance			
				Aqueous Extract, p. c.	Reducing Substance as Invert Sugar		
		Water, p. c.	Ash, p. c.		Before in- version, p. c.	After prelimi- nary inversion, p. c.	After 4 hours' inversion, p. c.
1	Saffron—Select	8.42	5.01	73.97	23.54	24.05	39.17
2	" —Superior	8.63	5.62	71.62	23.60	24.27	39.12
3	" —Sierra	9.63	5.84	70.87	23.45	24.35	38.40
4	" —Manzanaces.....	8.68	6.83	70.13	22.57	23.35	38.11
5	" —Commercial I...	13.54	6.05	76.01	23.56	24.44	39.75
6	" —Commercial II...	13.49	5.81	74.72	24.35	24.92	39.65
7	" —Commercial III...	11.51	6.11	70.83	22.56	24.03	38.84
	Lowest	8.42	5.01	70.13	22.56	23.35	38.11
	Highest	13.54	6.83	76.01	24.35	24.92	39.75

The values exhibited in the above table run within such narrow limits that they become available as constants, a higher percentage than 77 per cent. of aqueous extract, or more than 25 per cent. of reducing substances (calculated as invert sugar) after the preliminary inversion, or more than 40 per cent. after 4 hours continuous boiling with hydrochloric acid, leading to the assumption of an adulterated article. The author also has determined and describes a reliable method for detecting the presence of glycerin, which must

be consulted in the original.—Pharm. Ztg. lvii (1912), No. 41, 411-412.

Orris Root—Cultivation.—C. Bühner describes orris root culture in Italy, explaining favorable soil (rocky rather than rich; time of planting, August and September); method of planting (in furrows 40 centimeters apart and preferably in fields previously planted with

FIG. 40.



Mysore Cultivated Cardamom Plant.

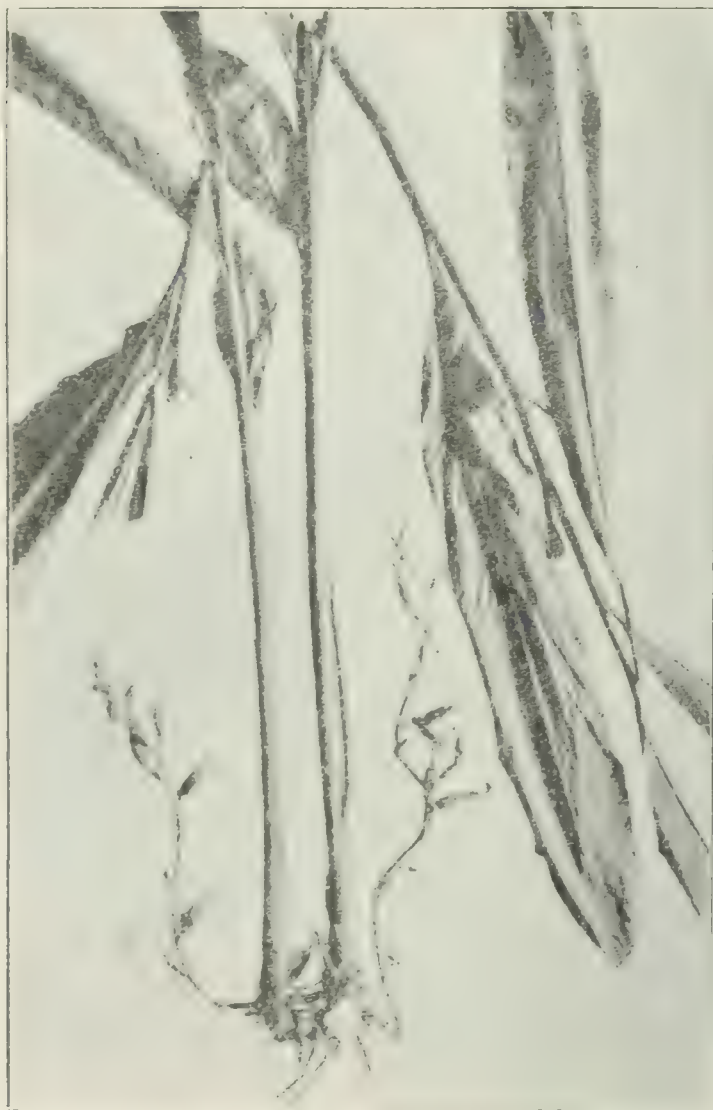
nitrogen-producing legumes); harvesting (the following June or even two years later), and method of preparing for the market. Part of the harvested root is replanted, the rest is peeled, washed in running water and sun dried, preferably by the morning sun, for eight days. Artificial dessication makes a product less white than sun-dried, hence of less value. The laborers get 10 centimes per kilo for the washed root. On drying, the roots lost about one-third

their weight.—Schweiz. Wschr. f. Chem. u. Pharm. L (1912), No. 35, 532. (H. V. A.)

ZINGIBERACEÆ.

Cardamoms—Cultivation and Curing in Ceylon.—The following interesting particulars are abstracted from a comprehensive mono-

FIG. 41.



Wild Cardamom Plant of Ceylon.

graph on the cultivation, curing, and commerce of cardamoms by H. F. MacMillan of the Peradeniya Botanic Gardens, Ceylon, which is illustrated with numerous photographs, exhibiting the Mysore variety of the cardamom plant cultivated in Ceylon (Fig. 40), and the wild cardamom plant of Ceylon (Fig. 41), together with plants growing in the Peradeniya Gardens, a cardamom plantation, and the

various operations of curing the fruits and preparing them for export:

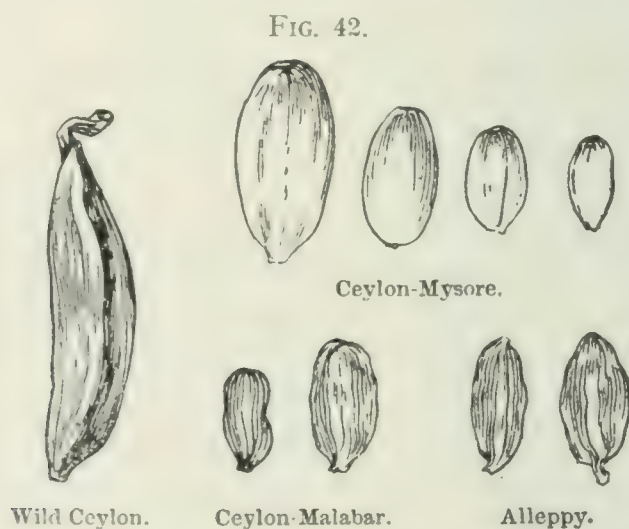
Mr. McMillan says the cardamoms of British commerce are derived from *Elektaria cardamomum*, Maton, which grows wild, or is cultivated on the Malabar coast of India and in Ceylon. The Malabar cardamom plant formerly yielded the bulk of this spice imported into England, but the cultivated Mysore variety now affords most of the fine quality. There appear to be two varieties of the Malabar cardamom plant, the one, var. *minus*, being confined to Southern India, the other, var. *majus*, growing wild in Ceylon; but there is much confusion regarding these plants, and it must suffice here to say that the so-called "Mysore variety" is evidently the "*minus*" variety of cardamom plants originally cultivated in "Mysore," and that it is this variety that is mainly cultivated in Ceylon.

It is in Ceylon that the cultivation of cardamoms has been raised to a fine art, with consequent improvement of the quality of the product. The plants flower almost all the year round, but principally in January to May. Picking begins at the end of August and continues until April, the months of October to December yielding most fruit. The first, or maiden crops, give the largest pods, while the earlier pickings also yield finer fruit. An average daily picking is 10 pounds. Curing is effected in dry weather by exposure to the sun, but in hot weather over-exposure is guarded against, as over-heating causes the moist seeds to swell and burst the shell. Three hours' exposure in the morning and two in the afternoon are sufficient in the heat. The operation is conducted in trays placed on trestles, which are readily protected from the sun, or in case a shower threatens, by covering, while in continuous wet weather drying is effected by transferring the trays into the curing house in racks, exposed to gentle heat—the proportion of split fruit being the smaller the slower the drying. The fruits dried by artificial heat, however, are more brown in color than those dried in the sun, hence the curing house is so arranged that the trays can be quickly removed, so as to take advantage of the sun's rays. Moreover, the color can be improved by sun-bleaching the capsules after sprinkling with water, but this increases the proportion of split fruit.

The capsule still bears the remains of the calyx tubes at the apex and the stalk at the base; these, formerly removed by hand clipping, are now removed by machinery, an operation which is shown in one of the photographs. The grading of the fruit is effected by means of sieves with meshes of different sizes, while sorting as to

color is also followed, as are the split fruits (averaging 10 to 15 per cent.), broken shells, and seeds. The accompanying cut (Fig. 42) shows, natural size, the types of "Ceylon-Mysore" cardamoms, known respectively as "longs," "mediums," "shorts" and "tiny"—the plump "Ceylon-Mysore" being the type of cardamoms most approved in England. These, after grading, are sulphured by placing them in trays over burning sulphur, and are then packed for export.

As shown in the illustration, the Ceylon-Mysore cardamoms vary in length from $\frac{1}{4}$ inch to $\frac{3}{4}$ in. The smaller cardamoms of this type are ovoid, or nearly globular, but the longer fruits are more or less indistinctly three-sided, the angles of the plumper ones being quite rounded. Size, plumpness, color, and smoothness of the shell form



Types of Ceylon-Mysore Cardamoms.

the chief criteria in pricing. The best capsules are creamy white, smooth and silky. Reference to the cut will also allow comparison of varieties of cardamoms of commercial importance. The wild Ceylon cardamom is the largest, sometimes attaining $1\frac{1}{2}$ in. in length. It usually possesses a dark brown and coarsely striated shell, the sides being sunken and the angles sharp. Malabar cardamoms are exported both from Ceylon and India. The shell of this cardamom is generally brown and striated. The "Alleppy" are very similar to the Malabars, but larger and appear both bleached and unbleached, the latter retaining a peculiar green color. A round type of cardamom (not shown), known as "Ceylon Mangaloses," sometimes reaches London, and fetches good prices. Decorticated seed obtained from over-ripe fruit is also a regular article of commerce.—Chem. & Drug., Mar. 9, 1912, 367-371.

Costus Root—Perfume Value of the Oil.—H. Mann contributes an article on the use of costus root oil in perfumery, in the course of which he says that, although this oil imparts a touch of distinction to articles prepared with it, it is but little used, probably, in part, because it cannot always be procured. The odor of the freshly distilled oil is at first not exactly pleasant, but gradually it develops a most agreeable violet-like aroma, which also helps to fix other odors. The employment of old oil is not to be recommended, as it possesses an unpleasant accessory odor, which easily penetrates other odors, and thus has a predominating effect. It is advisable to stock this oil in the form of a 10 per cent. alcoholic solution. Used in conjunction with vanillin and Portugal oil in particular, it produces excellent scents. Many French powders owe their popularity to the odor of costus root oil.—Schimmel's Rep., April, 1912, 59; from Seifensieder Zeitung, 39 (1912), 160.

Galanga—Remarkable Sophistication.—H. V. Rosendal calls attention to a curious sophistication of galanga root. The article supplied as galanga consisted almost entirely of red-brown, spheroid-conical pieces, about 3 Cm. long and 1.5 Cm. thick, resembling galanga root in form, but on nearer examination was devoid of the characteristic features of the drug and had only a faint taste and odor of galanga. These pieces were comparatively heavy, gave a metallic sound when dropped, and yielded under the knife a red-brown powder, which exhibited no structural elements under the lens. The chemical examination revealed the presence of silica, alumina and iron in abundance, with only small quantities of lime, the ash remaining on incinerating the dried drug amounting to 72 per cent. It is evident from this that the sophistication consists of an artificial product, composed of 5 per cent. of powdered galanga root and 95 per cent. red bole.—Pharm. Ztg. lvii (1912), No. 30, 303; from Svensk. Farm. Tidskr., 1912, No. 7.

ORCHIDEACEÆ.

Orchis Hircina—A Rare British Plant.—A. E. White has found a specimen of the "lizard orchid," *Orchis hircina*, at Great Chart, near Ashford, Kent, and sent a photograph of the spike of the orchid to the "Chemist and Druggist," which is reproduced in that journal, but is unfortunately so indistinct that it cannot be advantageously reproduced for this report. This British orchid was thought to be extinct, no specimen having been found for forty years until a spike was found at Wye, near Ashford, in 1898. One has appeared at intervals since. The length of the spike, which bears about fifty

flowers, is 15 inches. The number of minute seeds produced by a spike is enormous, being about 50,000, but anyone attempting to cultivate the plant would think himself lucky in securing a single healthy seedling. No British orchid bears such a large spike, and botanical chemists would have no difficulty in recognizing this splendid orchid if they should be fortunate enough to find a specimen in the course of their rambles.—Chem. and Drugg., July 27, 1912, 169.

Salep—*Property of Coagulating Milk*.—E. Reeb observes that while others have noted that salep possesses, like diastase, the property of coagulated milk, the immediate substance to which it owes this property has not been mentioned. He has identified this to be

Erythrodextrin, but finds that this body, in distinction from diastase, will retain its coagulating property even after heating it to 100° C.—Pharm. Ztg. lvii (1912), 75, 759; from Journ. der Pharm. v. Elsass-Lothringen, 1912, No. 8.

PROTEACEÆ.

Grevillea Robusta—*Quebrachite a Constituent of the Leaves*.—E. Bourquelot and A. Fichtenholz have isolated from the alcoholic extract of the fresh leaves of *Grevillea robusta*, a crystalline substance which, when purified by re-crystallization from alcohol, was identified as quebrachite, $C_7H_{14}O_6$. It forms large anhydrous rhombic crystals, melting at 190° C., and when treated with hydriodic acid yields lævo-inositol, thus proving its identity with quebrachite, or methyl lævo-inositol. Quebrachite is obtained from grevillea leaves in a yield of 0.4 per cent., whereas quebracho bark contains only 0.1 per cent.—Pharm. Journ. and Pharmacist, Nov. 2, 1912, 553; from Journ. de Pharm. et Chim., 1912, 6, 346.

LAURACEÆ.

Acronychia Laurifolia, Bl.—*Yield and Constants of Volatile Oil*.—At Buitenzorg 198 Kgm. leaves of *Acronychia Laurifolia*, Bl., known in Java as 'kisavia,' yielded 133 Cc. of volatile oil possessing the following constants: Sp. gr. at 26°, 0.915; opt. rotation, +1° 52'; sap. val., 11; ester val. after acetylation, 50.9. The oil contained no aldehydes.—Schimmel's Rep., April, 1912, 23; from Jaarb. dep. landb. in Ned.-Indië.

Camphor Trees—*Insect Pests in German East-Africa*.—Speaking of insect pests in camphor-trees, H. Morstatt observes that, although camphor occurs in all parts of camphor-trees, and is itself an efficient protection against the attacks of insects, it is powerless to protect

the camphor-tree from such pests. Thus, in German East-Africa the camphor-tree is attacked by slugs, shield-lice, locusts, bugs, mites, and certain kinds of beetles. The weevil, *Dicasticus Gerstaeckeri*, Faust, is occasionally found in the tree in enormous numbers, and the capricorn-beetle, *Tragocephala pretiosa*, Hintz, an insect measuring from 8 to 10 inches in length, often inflicts serious damage upon the tree.—Schimmel's Rep., April, 1912, 37; from "Der Pflanzer," 8 (1912), 18.

Camphor—Possibilities of Increased Production in China.—In a report from Consul-General George E. Anderson, Hongkong, attention is directed to the significant fact that while the supply of camphor trees hitherto available for the production of camphor on the coast regions of China has been used up rapidly, more trees are available in the interior, and that the camphor possibilities in China are much greater than its production has ever indicated. In its best days, the business in China was without adequate organization, while in Formosa it had been and is now under effective control. In China trees are not found close together as they are in the primeval forests of Formosa, but they cover vastly greater territory, and the actual possibilities of camphor production are far beyond those of Formosa. With regard to the present commercial prospect, the consul says that Chinese camphor is inferior in quality to the Formosan camphor, chiefly because of the crude methods of manufacture employed leaves a greater amount of impurities, while the wasteful means of production make it cost more than it should. Foochow camphor is of better quality than that made in Kwangtung, because the natives of Foochow are further advanced in its manufacture, and there is no reason why Chinese camphor should not be marketed in as good quality and condition as that of Formosa or any other locality, if the trade is looked after and its manufacture encouraged. At present the trade is altogether in the control of several German firms.—Amer. Journ. Pharm., Feb., 1912, 77-80.

Camphor—Distillation and Yield from Dried Leaves.—In continuation of a previous paper on the preparation of camphor in Amani, German East-Africa, Lommel describes experiments on the distillation of camphor from dried leaves, which, after some disappointing results, were satisfactory when carried out as follows: The green leaves were dried on previously cleaned ground under the shade of cultivated cinchona trees. In the course of about a fortnight they were dry enough to be readily stripped from the branches and, collected in sacks, they were carried to the still. This experiment gave

a thoroughly satisfactory result, the yield being 1.55 per cent. crude camphor and 0.49 per cent. camphor oil. In view of the fact, pretty well established, that it is possible to cut the trees twice a year, it is reasonable to expect a five-year-old plantation to yield about 8400 pounds of dry leaves per acre. This would be equivalent to an output per acre of about 325 pounds of camphor and about 103 pounds of camphor oil.—Schimmel's Rep., April, 1912, 35-40; from *Der Pflanzer*, 7 (1911), 441.

Jamaica Camphor—Determination in Leaves, Twigs and Wood.—H. W. Emerson and E. R. Weidlein, of the University of Kansas, state as the result of a determination of the camphor in leaves, twigs and wood of camphor trees grown in Jamaica, that it is possible to grow camphor to advantage in Jamaica. The leaves were found to be richer in camphor than the twigs or the wood, and they state that very little camphor is lost by the ordinary weather drying of the leaves. The green leaves were found to average 1.32 per cent. pure camphor; dried leaves=1.569 per cent.; green twigs=0.58 per cent.; dried twigs=0.5445 per cent.; wood=0.61 per cent.—*Jour. Ind. and Eng. Chem.*, Jan., 1912, vol. 4, p. 33. (L. A. B.)

Camphor.—An editorial (*J. Am. M. Assoc.*, 1912, v. 58, pp. 1204-1205) points out that within the past year or two it has been found that the leaves of the camphor tree yield on distillation about 1 per cent. of camphor, and that the crude product distilled from the leaves dried by the sun contains less oil, and therefore requires less purification than the drug obtained from the other parts of the tree. (M. I. W.)

Cinnamomum Parthenoxylon, Meissn.—Constants of Oil Distilled from Wood.—An oil distilled at Buitenzorg from the chips of "selasian wood" (*Cinnamomum Parthenoxylon*, Meissn.) gave the following constants: Sp. gr., 1.067; opt. rot., $+1^{\circ} 3'$; sap. val., 8.4; ester val. after acetyl., 11.8.—Schimmel's Rep., April, 1912, 42; from *Jaarb. dep, landb. in Ned.-Indië*.

"Lawang" (or Massoi) Bark—Yield and Properties of Volatile Oil.—E. W. Mann has distilled and examined a volatile oil, in a yield of 0.5 per cent., from a bark shipped from the Dutch East Indies, where it passes by the name of "Lawang," but which submitted to Mr. E. M. Holmes was identified as being one of the barks passing under the name of "Massoi-bark," and doubtless derived from some species of *Cinnamomum*, or *Litsea*, or allied genus. The oil, which is heavier than water, possesses a striking odor, recalling nutmeg, sassafras, and cloves, and gave the following constants:

Sp. gr. at 15.5° , 1.0104; rotation (in 100-Mm. tubes) at 20° , -6.97° ; refract. index at 15.5° , 1.5111 (at $20^{\circ}=1.5095$); acid val., 1.15; sapon. val., 43.02; ester val., 41.87; sapon. val. after acetylation, 121.91. Readily soluble in 2 vol. of 80 per cent. alcohol.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1912, 473-475.

POLYGONACEÆ.

Fagopyrum-Rutin.—Previous work on buckwheat poisoning (Fagopyrism) showed presence in the buckwheat plant of a principle closely resembling rutin, the glucoside found in rue. Brandl and Schartel now confirm the identity of the two substances finding that the buckwheat rutin melts at 188° , has formula $C_{27}H_{30}O_{16} \cdot 2H_2O$, hydrolysis to quercetin ($C_{16}H_{10}O_7$) rhamnose and dextrose. The quercetin was further identified by production and combustion of its acetyl compound $C_{15}H_5O_7 \cdot (C_2H_3O_2)_5$. A simple method of extraction of the rutin from fresh buckwheat plant (yield about 1%) is given. Arch. d. Pharm., 250, (1912), No. 6, 414. (H. V. A.)

Radix Lapathi—*Constituents*.—Tschirch and Weil report an examination of the root of *Rumex obtusifolius*. Opening with a review of work on the root done by Hesse and by Flückiger and, after describing several preliminary tests, they chose extraction with alcohol in a Soxhlet apparatus as the best method of removing the active principles.

The alcoholic extract was evaporated and shaken with ether and the ethereal extract on evaporation left a dark brown resinous mass, which while soluble in ether, alcohol and acetone and partly soluble in benzene, toluene, chloroform and acetic ether, could not be purified by separation from these solvents. The evaporated alcoholic extract distilled with steam gave a trace of a volatile oil smelling like valerianic acid. The original alcoholic extract was diluted with about 20 volumes of water when a flocculent yellow precipitate was formed. This precipitate after drying was extracted with ether in a Soxhlet apparatus (to remove fat) and after drying to remove last traces of petroleum ether, the residue was further extracted with ether. The ethereal extract was evaporated and the dark brown residue was treated with 10 per cent. sodium hydroxide solution which dissolved what proved to be a small amount of emodin, while the alkali-insoluble part gave reactions for chrysophanic acid. The precipitate produced by addition of water to the alcoholic extract proving of little interest, the watery liquid itself was examined for anthraquinone derivatives. As shaking out with ether showed no

oxy-methyl anthraquinone, the liquid was hydrolysed with 5 per cent. sulphuric acid, cooking for two hours. This caused a precipitate which, after washing and drying at 70° was extracted in a Soxhlet apparatus with ether and after distillation of the solvent, the residue was cooked with 10 per cent. sodium hydroxide solution. *The alkali insoluble part* after washing and drying and crystallization from benzene proved to be a mixture of chrysophanic acid and its methyl ether, such mixtures having a melting point ranging from 162° to 184° (according to the amount of the methyl ether present) while pure chrysophanic acid melts at 196°.

The alkali soluble part was acidulated with hydrochloric acid and the precipitate after washing, drying and crystallizing, first from pyridine, then from alcohol, proved to be Frangula-(Rheum)—Emodin (M. P. 255°-256°). This was all that was obtained from the precipitate formed when the alcoholic extract was hydrolysed so the filtrate from this hydrolysis was examined and yielded on shaking out with ether no anthraquinone bodies, but did give colorless crystals which had an acid reaction and which on purification by precipitation as a lead salt and dissolving in ether after treatment with hydrogen sulphide, showed on combustion the formula $C_{12}H_{18}O_{14}$.

This body, which the writers call lapathinic acid melts at 228° with evolution of gas, is soluble in water, alcohol, ether and acetic-ether, is insoluble in chloroform and petroleum ether and has the properties of a chromogen.

The root also contains tannin and sugar (from hydrolysis of the anthraquinone glucosides and tanno glucosides) and also 0.379 per cent. iron. The paper closes with a report of a partial examination of the root of *Rumex alpinus* which brought out the interesting fact that in dry form, it contained about 13 per cent. cane sugar—Arch. der Pharm., 250, (1912), No. 1, 20. (H. V. A.)

Rhubarb—Geographical Distribution, Cultivation, etc., with Particular Consideration of the Plant Yielding the Official Drug.—Dr. C. Hosseus has published the results of a comprehensive study of the geographical distribution of rhubarb plants, touching first upon the historical facts regarding the introduction of the drug, and confirming, on the basis of his further investigations, his previously expressed opinion (see "Report," 1911, p. 175) that only *Rheum palmatum*, L., can be regarded as being the parent plant of the official drug. Furthermore, he discusses the methods of its cultivation and preparation as described in the literature, and advances the opinion that the cultivation of the official drug in the

calcareous soil of some portions of Germany and Austria promises to become very successful. Quoting from the studies of Maximowies and others, he says:

"The rules for the cultivation of rhubarb (*Rheum palmatum*, L.) are the following: A light, loose, black humus. Setting out the plants in such spaces that they may develop completely (about 8 feet apart, so that the leaves may properly spread out). Providing shade by means of trees; sprinkling with regularity, (because of the moist climate prevailing in Kanzu, where the drug is most successfully cultivated), and selecting situations exposed to the south. Furthermore, inasmuch as the content of medicinally active substances in rhubarb goes hand in hand with its content of crystalline calcium oxalate, it is considered necessary for the proper development of the drug that the water-supply should consist of hard water containing an abundance of lime. Indeed, it seems probable that failure to provide such a supply has hitherto been responsible for the inferiority of rhubarb cultivated in Europe."—Pharm. Ztg., lvii (1912), No. 23, 232; from Oesterr. botan. Ztschr., 1911, No. 12, and 1912, No. 1.

SCROPHULARIACEÆ.

Digitalis.—*Its Cultivation, Collection and Preparation*, furnishes the text for an elaborate and comprehensive paper by Edwin L. Newcomb, P. D., of the Department of Pharmacognosy, College of Pharmacy, University of Minnesota, in which, referring to the need for experimentation in the production of the drug digitalis from cultivated plants by workers in the different sections of our country, and after references to numerous papers which have appeared, from time to time on the cultivation of medicinal plants—by Tschirch, Chevalier, McEwan and Forrester, Thoms, and others—he describes in great detail the work that has been and is being done by the School of Pharmacy of the University of Minnesota. This work has been directed first to develop conditions for the various plants approaching those under which they naturally grew, and then to study the effects of variations, selections, breeding, etc., with the end in view of increasing the educational facilities of the College.

It is impracticable to enter into a description of the work that has been done, which was not confined to the study and experimentation of *Digitalis purpurea*, but included a number of varieties as well as other species. The following have been grown during the past year, the leaves collected, prepared by various processes of

drying, and transferred directly from the driers to tin cans holding about one pound each—a one ounce wide-mouth bottle filled with freshly burnt lime and covered with gauze being placed in each can: *Digitalis lutea*; *D. purpurea maculata superba*; *D. lanata*; *D. grandiflora*; *D. purpurea mixed*; *D. purpurea monstrosa*; *D. purpurea alba*; *D. purpurea rosea*; and *D. ferruginea gigantia*.

The author observes that probably much of the drug sold at present consists of different varieties of *Digitalis purpurea*. It is important therefore to note that the medicinal value of the drug prepared as above mentioned is being carefully studied by chemical and physiological assays and will be reported on in a later paper. The present paper is illustrated by two half-tone engravings, the one showing one of the large ovens for quickly drying digitalis leaves, the other showing abnormal forms of leaves of *Digitalis purpurea*.—*Amer. Jour. Pharm.*, May, 1912, 201-214.

Digitalis Leaves—Precautions Against Immature Collection.—Caesar and Loretz, referring to the fact that digitalis leaves collected too early in the season possess only half the activity of the leaves from mature plants, state that in consideration of this fact, as well as of the damage to the plants by this immature collection, the Forestry authorities in the Harz district have prohibited the collection of the drug before the beginning of July and after the end of September.—*Pharm. Ztg.*, lvii, (1912), No. 84, 845; from Caesar & Loretz's *Ann. Rep.*, 1912.

Digitalis—Resumé of the Active Constituents of Leaves and Seed.—In an address delivered before the "Rostock Apothecaries Society," Professor Kobert gave the following interesting resumé regarding the active constituents of digitalis:

The leaves and seeds of *Digitalis purpurea* and *Digitalis grandiflora* contain glucosides of the digitalin-group as well as glucosides of the saponin-group—the leaves containing the active substances, digitoxin, digitophyllin and gitalin, together with the inactive saponins gitin and digitsaponin, while the seeds contain digitalein and gitalin, of the digitalein-group, together with the active saponins digitonin Schmiedberg and digitonin Kiliani. Beside these well-defined substances, digitalis contains some enzymes the composition of which has not yet been thoroughly investigated, but of which it is known that they possess oxidizing and hydrolyzing action upon the glucosides and thereby reduce their activity. Furthermore, it has been found that manganese is a constant associate of these enzymes (also called oxydases), and that therefore the leaves of the yellow variety of foxglove (*Digitalis grandiflora*),

containing less manganese than those of the red variety (*D. purpurea*), are correspondingly less susceptible to this decomposition. To a certain extent protection from this change is afforded by properly and quickly drying the fresh leaves; but this is not always practicable in the case of wild growing digitalis, the leaves of which do not at once reach the pharmacist after collection, and have frequently undergone change before they are delivered. The final products of the decomposition of the three active cardiac glucosides, namely gitalin, digitoxin and digitalin, are considered, aside of the glucoses split off by their hydrolysis, to be completely inactive, and consist of the so-called digitoxigenin and digitaligenin. Of the active substances of digitalis leaves—digitoxin, digitophyllin and gitalin—only the last named, gitalin, is represented in the infusion, into which it passes along with digitsaponin, so that digitalis leaves, even when extracted thrice successively with boiling water, do not lose their activity completely. But inasmuch as the infusion of the leaves possess extraordinary salutary properties, it is demonstrated that gitalin must be considered by the practicing physician as being the most important component of the drug. In a chemically very impure condition it has heretofore been supplied under the name of “digitalein,” but it is now only a question of time when it will be available in a chemically pure form. Prof. Kobert recommends, in order to utilize the activity of the leaves completely, that the administration of the infusion be alternated with a dose of digitoxin, and that similarly the activity of the seeds may be secured by alternately administering solution of gitalin and digitalinum verum Kiliani.—Pharm. Ztg., lvii, (1912), No. 59, 597.

Digitalis Leaves—Constituents.—In a comprehensive review of the constituents of Digitalis leaves published in E. Merck's Annual Report, 1912, a detailed description of the digitalis glucosides and of other principles associated with them that have been announced from time to time will be consulted with great interest. Preliminarily the work of Homolle, Quevenne, Walz, Nativelle, Schmiedeberg and Kiliani, which led to the discovery the innumerable digitalis glucosides—among them some that have proven to be of pronounced therapeutic value—is discussed and this is followed by a review of the digitalis substances themselves, their synonymous designations and their derivatives. The fact that this embraces a list of more than one hundred different names gives evidence of the interest which has been taken and the immense amount of research work that has been done, but at the same time also the difficulties that have been encountered in the endeavor to isolate from digi-

talís leaves a single substance uniting in itself the complete activity of the drug.—*Pharm. Ztg.*, lviii, (1912), No. 48, 481.

Digitalis—Physiological Assays.—Dr. James Burmann publishes a short article strongly criticising all physiological digitalis assays with the frog, and particularly the method recommended by Focke.—*Schweiz. Wschr. f. Chem. u. Pharm.* 1 (1912), No. 51, 757.—(H. V. A.)

Digitalis—Simple Chemical Assay Method.—In an elaborate research undertaken with the object of a comparison between physiological and chemical results with an approximate simple chemical assay method of digitalis, W. Harrison Martindale briefly reviews the knowledge of the digitalis glucosides and the various methods that have from time to time been suggested and employed for the valuation of the leaves and the various preparations made from them. It occurred to him that there would be considerable utility and value in a simple chemical mode of assay, if such could be devised—a process, in fact, which would, if possible, render the pharmacist in future independent of the physiologist. It is well known that great diversity of strength exists in digitalis leaves collected at different seasons in the same locality; also that the soil, the prevailing climatic conditions, etc., may cause marked variations. Hence the author resolved upon a systematic study, covering: (1) Examination of Infusions. (2) Examination of Tinctures. (3) Physiological Assay. (4) Devising an approximate simple chemical assay and the comparison with physiological results. Preparations of leaves in the form of infusion and tincture from various parts of Great Britain, also from several European countries were examined. Glycerin extracts and a tincture of the seeds were also included. The numerous experiments involved in this comprehensive study must be consulted in the original, and it must suffice here to mention the following from the author's summary:

(1) Digitalis preparations can be assayed by a simple colorimetric chemical method (indicating the content of combined "active water-soluble" glucosides).

(2) The process devised by the author, though not claimed to be absolutely accurate on comparison with physiological methods, will, at any rate, show whether a tincture is above or below standard, and it will certainly show an excessively strong or a weak preparation. The method requires only a small amount of tincture; the apparatus and reagents are perfectly simple, and such as a pharmacist would have on hand; and the process takes only about 3 hours to carry out.

(3) There are strong indications that digitoxin is not entirely insoluble in water.

(4) The routine use of animals in assays is not justifiable if a chemical method can be devised to produce equivalent results. The pharmacist should, if possible, be able to assay all the drugs he dispenses.

(5) Considering the danger in the variation of a tincture, and the fact that with digitalis the initial doses are invariably large, it is evident that standardization of its preparations is of great importance.

(6) There is much to be learned as to the ideal conditions for growth of digitalis. The most potent leaves examined were second year's leaves from plants grown in England in a sunny exposed situation.

(7) An active glycerol-alcohol extract can be produced of strength 1:1; in fact, exactly equal in strength to eight times that of a B. P. Tincture.—Pharm. Journ. and Pharmacist, December 14 and 21, 1912, 745-748 and 778-780.

Digitalis—Chemical Assay.—Dr. James Burmann, emphasizes the possibility of a chemical assay of this drug which will be at least as accurate as the total toxicity method of biological assay. He explains the difficulties of chemical assay due to diversity of glucosidal bodies found in digitalis and the uncertainty of which these glucosides produce the desired action, showing that by the Keller method it is not the true digitoxin which is estimated but another body which he (B.) calls pseudo-digitoxin. He points out the errors in the assays of Fromme and of Ecalle and summarizes precautions necessary to successful assay, all of which (for example, "Do not use rubber corks in distillation") are self-evident to the trained analyst. He then proceeds to give his method which unfortunately was performed only with a "Dialyse Digitale" in which he is presumably commercially interested. He mixes 100 Gm. of this "dialyse" with 60 Gm. absolute alcohol and after bringing the fluid to 190 Gm. with 50 per cent. alcohol, adds 30 Gm. solution lead subacetate (Sp. Gr. 1.240) and 30 Gm. absolute alcohol. The precipitate of organic matter thus formed is filtered off and 125 Gm. of the filtrate (representing 50 Gm. of the "dialyse") after removal of lead with hydrogen sulphide, is concentrated at not more than 50° C. to 50 Cc., then made alkaline with 2 Cc. 10 per cent. ammonia and shaken out with chloroform. The chloroformic extract is evaporated, is redissolved in 3 Gm. chloroform, 7 Gm. ether is then added and the glucosides are precipitated from this solution by addition of 50 Gm. petroleum

ether. This precipitate which is then dried to constant weight, is a white amorphous powder responding to all the reactions for digitoxin and on recrystallization from absolute alcohol solution by addition of a little water, shows under the microscope the crystalline rosettes of pseudo-digitoxin and the prismatic tables of true digitoxin. By fractional crystallization, Burmann has separated enough of the two glucosides to estimate the melting points which he finds to be 145° - 150° and 247.5° respectively.

Comparing what he calls his "total assay" with the assay by the Keller method on the same dialysate, he deduces the amount of true digitoxin and gives the following table:

	I	II	III	IV
Total assay.....	0.152%	0.148%	0.118%	0.111%
Keller assay.....	0.118%	0.116%	0.091%	0.085%
Digitoxin.....	0.032%	0.032%	0.027%	0.026%

He has tested the accuracy of his scheme by running assays of the dialysate, to which he added definite amounts of Merck's crystalline digitoxin and finds that increased weight of the glucosidal mixture agrees with the weight of added digitoxin. The paper concludes with reports of biological assays of the dialysate and of the pseudo-digitoxin of Keller and the total digitoxin obtained therefrom.—Schweiz. Wschr. f. Chem. u. Pharm., 1 (1912), No. 11, 153. (H. V. A.)

Digitalis—*Relative Activity of Leaves Gathered at Different Times in the Year, of Leaves and Petioles, etc.*—At the meeting of the British Pharmaceutical Conference, Gordon Sharp, M. D., and F. W. Branson reported the results of an investigation undertaken with the object primarily to ascertain if a tincture of digitalis made with 90 per cent. alcohol remained active for a longer time than the ordinary B. P. preparation, made with 60 per cent. alcohol. Incidentally, also, other points kept in view refer to the relative activity of the petioles, and of the tinctures prepared from leaves gathered at different times of the year, to leaves growing wild, or partially cultivated, and to leaves from plants which had flowered or had not flowered. The results showed:

1. That tinctures prepared from the petioles were only about one-half the strength of those prepared from the leaves.
2. That a potent preparation can be produced from both wild and half-cultivated plants.

3. That leaves gathered in November are as active as those gathered in August.

4. That leaves collected from plants which had flowered and from plants which had not flowered were equally toxic.

5. That there is no apparent advantage resulting from the use of the stronger alcoholic menstruum. Indeed, the results are rather in favor of the 60 per cent. menstruum, since of the nine tinctures prepared from different kinds of leaves with 60 per cent. alcohol, seven were up to the standard at the end of twenty months, whereas only four of those made with 90 per cent. alcohol came up to the standard.

At the end of twenty-eight months only one tincture in each set had retained its standard, both having been prepared from leaves of partly cultivated flowering plants, collected in October and November, (1909), respectively.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy) 1912, 442-447.

Digitalis: Duration of Clinical Action.—Eggleston, Cary, reports a number of observations on the duration of digitalis action, and points out that this action may, and often does, persist for some considerable time after the administration of the drug has been stopped. He also states that the use of the term "cumulation" is a very loose one as at present it is being applied to widely different conditions. The general application is to express the development under small repeated doses of a drug of symptoms which are much more marked than those caused by a single small dose. In the case of digitalis cumulation would be the result of a simple summation of the amounts fixed and absorbed in the tissues, probably of the heart, and, owing to the firmness of this fixation, the intake is in excess of the elimination.—J. Am. M. Assoc., 1912, v. 59, pp. 1352-1357. (M. I. W.)

Digitalis Preparations and Some of the New Substitutes for Them.—An editorial calls attention to a report from the Pharmacological Laboratories at Cambridge, England, which reiterates the frequently made statement that so far not one of the new, generally proprietary, preparations of digitalis has made a successful bid for superiority over an active tincture of digitalis.—J. Am. Med. Assoc., 1912, v. 59, pp. 2074-2075. (M. I. W.)

Escobedia Scabrifolia.—This plant grows in tropical America from Mexico to Paraguay and its root is employed by the Mexicans in coloring yellow the fats used there in place of butter. The plant which, in Paraguay is called "Icypo'yu" is herbaceous, 0.5 to 1 meter high, with sessile, opposite, entire, coriaceous, three to five nerved,

stem leaves, oval in shape, obtuse at tip, with small alternate rugose radical leaves; with stem that is enlarged at base with a short rhizome, from which extend roots of variable size (2 to 5 Mm. in diameter). The stems and roots are brown and longitudinally striated and a section of either shows the coloring matter embedded in the cortical parenchyma. The anatomy of the plant may be summarized as follows:

The *rhizome* shows a well-developed secondary bark which is limited externally by a rhytidoma ("bark") found at different depths, near which the coloring matter resides. This dye is in most of the cells in the neighborhood of the liber and that in red-orange-brown masses. The cells also contain starch granules in groups of 3 or 4 and sometimes more; the size of the granules running from 7 to 16 microns.

Below the bark, comes the parenchyma containing isolated sclereids 6 to 10 times longer than broad and terminating in rectangular facets. These sclereids are also occasionally found in the librous parenchyma. The liber is not in a continuous zone but are wedges separated by medullary rays some twelve cells thick. The wedges extend into the wood sometimes even to the pith. The wood is strongly parenchymatous containing irregular groups of lignified cells forming the fibres and ducts. The parenchyma cells of this zone are filled with starch granules.

The *stem base*, just above the rhizome and subterranean, has hard and compact wood and a bark rich with the coloring matter. Around the pith, which is about 1 Mm. in diameter, are found four or five layers of protoxylem then comes the solid secondary wood which is a mixture of fibers and ducts regularly divided into wedges by medullary rays, 3 to 6 cells thick running from the pith to the cambial layer. The duct walls are dotted with openings of characteristic shape and the original boundary between adjacent ducts is practically obliterated. The fibers have very large lumen while the cells of the medullary rays are somewhat longer than broad with slightly dotted walls. Beyond the wood is found liber and bark of same structure as of rhizome with short obtuse sclereids.

The *erial stem* is octagonal on cross section and is characterized by the wood rings of irregular contour which appear as more or less large islands just outside the well developed pith, separated by broad medullary rays. The individual elements are similar to those of stem base. Beyond the wood, is the liber enclosing isolated fibers, then the bark, which contains none of the coloring matter

but in which the fibrovascular bundles leading to the leaves are sometimes seen.

The roots and rootlets have a bark filled with the coloring material while there are no sclereids in the cortical parenchyma. A cross section shows on exterior a single row of corky tissue; then a periderm, the thickness of which depends on age of root; then endoderm with the Caspary's dark spots and suberized bands well defined; then a central cylinder commencing with a pericycle one cell wide, and differing in structure according as the root is young or old. In the rootlets each bundle of protoxylem is accompanied by numerous fibers; in the roots the construction differs because of peculiarity of growth of the cambium. In these, the central cylinder (inside the cambial layer) consists of (a) secondary wood zone very rich in large ducts and so separated by broad medullary rays as to resemble islands surrounded by parenchyma; (b) a heavy zone consisting chiefly of fibers and (c) a small protoxylem, which in the older roots have some wood fibers that have partly sclerenchymatized.

The paper closes with a description of the coloring matter found in the root—the azafranin of Altmirano. It is insoluble in water, glycerin, oil turpentine and petroleum, soluble in alcohol, chloroform, glacial acetic acid, ether and notably so in fixed oils. Concentrated sulphuric acid turns it blue, then violet; concentrated nitric acid gives blue-green-brown coloration; while concentrated hydrochloric acid turns it directly brown. Alkalies dissolve it, while acids precipitate it from the alkaline solution. It is precipitated (from the solution in alkali ? rev.) by lead acetate, zinc chloride and mercuric chloride, is decolorized by oxidizing agents and in the spectroscope permits passage of red and green rays and absorbs the rays from green to violet.—Schweiz. Wschr. f. Chem. u. Pharm., 1 (1912), No. 18, 260. (H. V. A.)

SOLANACEÆ.

Datura Stramonium L. and *D. Tatula* L.—*Cultivation Experiments and Alkaloidal Content of the Leaves*.—The examination of individual plants of *Datura Stramonium* L. and *Datura Tatula* L. for their total alkaloidal content was undertaken by F. A. Miller and J. W. Meader for two reasons: First, as a means of following the effects of prolonged cultivation upon the percentage of alkaloids, and, second, as a means of selecting high yielding individual plants—these high yielding plants being intended to serve as parents for future generations from which continued selections can be

made. The leaves of four plants of *D. Stramonium* L. and three of *D. Tatula* L., both species common in this country, were selected for the experiments. The plants of *D. Stramonium* L. were grown from seed purchased in the London market, but the seed was not absolutely pure, as one *D. Tatula* L. plant appeared in the experimental plot from the first planting. The *D. Tatula* L. plants used in the experiment were transplanted from a vacant lot in Indianapolis. The two forms were grown under the same conditions on soil consisting of stiff clay loam. Cultivation was frequent and continued until mature seed could be obtained. In both cases, individual plants of vigorous growth were selected, and the leaves collected at corresponding stages of full maturity, those of *D. Tatula* L. Aug. 17, 1910, and those of *D. Stramonium* L. August 30, mature seeds being collected later and given the number corresponding to that of the plant from which they were obtained. After thoroughly curing the leaves at room temperature, they were stored in paper bags until one year later, and then assayed by the process of the U. S. P., with the following results:

Datura Stramonium L. leaves yielded respectively 0.47, 0.55, 0.52 and 0.46 per cent. of total alkaloid.

Datura Tatula L. leaves yielded 0.63, 0.65 and 0.47 per cent. of total alkaloid respectively.

There is thus shown that there is a marked variation in the total alkaloidal percentage of individual plants, but that *D. Tatula* L., a species very closely related botanically to the official *D. Stramonium* L. indicates a much higher alkaloidal percentage than the U. S. P. species. Both forms, furthermore, likewise show a higher percentage than any commercial drug examined by the authors during the past five years.—*Amer. Journ. Pharm.*, Oct., 1912, 446-449;

Stramonium.—*Investigation of the Oil of the Seeds*.—H. Meyer and R. Beer have subjected the fixed oil from the seeds of *Datura Stramonium* to comprehensive examination. Obtained by extraction with benzol, the oil was a clear greenish-yellow liquid having an unpleasant odor, soluble in most of the fat solvents, but insoluble in cold alcohol, and almost insoluble in hot alcohol; sp. gr., 0.923; acid val., 8.1; sapon. val., 202.2; iodine val., 113.2. The oil contains about 1 per cent. of phytosterol, and it yielded by fractionation of the fatty acids: 10 per cent. palmitinic acid, 62 per cent. oleic acid, 15 per cent. linoleic acid, and 2.5 per cent. daturinic acid—the latter being identified as γ -letadecylic (also known as margarinic acid), which is also a constituent of coffee seeds.—*Pharm. Journ.*

and Pharmacist, Aug. 24, 1912, 271; from Monats. Chem., 33 (1912), 311.

Dulcamara—*Chemical Composition*.—G. Masson, commenting on the method of the French Pharmacopœia of preparing extract of dulcamara, observes that however completely the extraction with water has been effected, the drug residue, dried and extracted *de novo* with boiling 95 per cent. alcohol, yields a notable amount of extract. From its green color this was thought to be chlorophyll, which the extract resembles in many ways, but a closer examination showed that chlorophyll was in reality present only in very small amount, and that it consisted largely of saponoids. It is therefore recommended that the drug should be extracted with aqueous alcohol, and the author goes on to show that dulcamarin is not an immediate principle, but an alkaline combination containing varying proportions of two acid saponoids. Dulcamara contains no solanine, but a glucoside, resembling and at the same time differing from the solanine of the potato. Besides inactive bodies, *e. g.*, albuminoid, gummy, and saccharine matter, the active principles are stated to be three in number, namely: (1) A non-glucosidic saponoid, *dulcamaretic acid*; (2) A glucosidic acid saponoid, *dulcamaric acid*; (3) An alkaline glucoside, *solaceine*. The "solanine" of dulcamara in solution in hot concentrated alcohol deposits from it in the form of a jelly, and in this respect it differs from the solanine of the potato as well as in its product of decomposition. The amount of solaceine found in the plant was an average of 1 per cent.—Pharm. Journ. and Pharmacist, July 20, 1912, 75; from Bull. Sci. Pharmacolog, May, 1912, 283.

Japanese Chillies—*Botanical Source*.—In a paper read before the British Pharmaceutical Conference, 1912, Mr. E. M. Holmes records the results of his investigations regarding the botanical source of the bright red Japanese chillies that have been imported into England during recent years. They are of a brighter color and cleaner appearance than any others in the market, but are deficient in pungency, so that they are preferred for garnishing or for adding to pickles, though unsuitable for making cayenne pepper. After describing the various types of these chillies met with in England, Mr. Holmes remarks that the evidence obtained from his inquiries points to the small Japanese chillies, called "Takanotsumi," as being derived from either *Capsicum conoides* or *C. frutescus*, or both, and that the slightly larger chillies, called "Tenjiku mamori," are de-

rived from a form of *Capsicum fastigiatum*, Rl., for which he proposes the name *Capsicum fasciculatum*.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1912, 521-525.

Potatoes—Determination of Sugar.—O. Claassen observes that in order to ascertain the starch-content of potatoes by converting the starch to glucose and then determining the latter, it is necessary to know what quantities of sucrose and glucose were originally present. The author finds the best method for this purpose to consist in making a hot alcoholic extract, and to determine the rotary power before and after the inversion; the glucose and cane-sugar are calculated by means of formula from the rotation figures. Lead acetate may be used to clarify the solution; it has been shown that this is capable of removing considerable amounts of glucose and fructose from solution, but the error due to this cause is in the present case negligible.—Pharm. Journ. and Pharmacist, Sept. 28, 1912, 393; from Chem. Ztg., July 2, 1912, 741, and July 6, 1912, 771.

Tobacco—Formation of Nicotine.—C. Ravenna and V. Babini have determined the amount of nicotine in tobacco plants which were treated under different conditions with different fertilizers, viz: (1) with solution of calcium nitrate, 1p., potassium chloride, magnesium sulphate, monopotassium phosphate, each 0.25 p.; (2) ferric chloride, a trace, exposed to light; (3) without nitrate solution, exposed to light; (4) with the nitrate solution, in darkness; (5) with the nitrate solution and 2 per cent. of glucose in the light; (6) with the nitrate solution and 2 per cent. glucose in the dark. While the results do not warrant the drawing of definite conclusions, it seems probable that the quantity of nicotine reached a maximum in the plants fertilized with glucose and exposed to the light, the minimum for the same in the dark.—Chem. News, Jan. 12, 1912, 24; from Atti delle Reale Acad. dei Lincei, xx, No. 8.

OLEACEÆ.

Jasmine—Cultivation and Yield of Oil.—A condensed account of the history and cultivation of jasmine is given in the "Perfumery and Essential Oil Record," May, 1912. Under the most favorable conditions 1000 kilos of bloom yield 4 kilos of concrete essence, or 2 kilos of liquid essence. Frost is one of the great enemies of the delicate crop, and the caterpillar also requires constant attention. Artificial jasmin essence has actually improved the sale of the genuine product, partly because the synthetic article needs a certain amount of the natural oil to give it character—partly also, it is hinted,

because it helps the grower to tide over a period of scarcity.—Pharm. Journ. and Pharmacist, June 1, 1912, 732.

Olive Oil—Improved Method of Purification and Sterilization.—The process of the French Pharmacopœia for the purification and sterilization of olive oil, for the purpose of injection, consists in shaking out twice with strong alcohol, and heating for ten minutes at 115°. According to M. Bélair, this process does not extract anything like the whole of the free fatty acids, and many washings are in fact necessary to secure neutrality of the oil. He accordingly suggests the following process: Titrate the free acidity of the oil, and on the basis of the result add to 100 Gm. of the oil to be purified the calculated quantity of the N/5 alcoholic potash to produce neutrality, place the mixture in a flask and shake occasionally during two days. Then separate the oil from the alcoholic liquid, and shake it out twice successively with 30 Cc. of 95-96 per cent. alcohol, each time during one day. Allow to stand over night, draw off the alcohol into a tared dish and heat on a sand bath at 110°-115° until a few Cc. in a test tube, cooled and treated with a crystal of fuchsin, does not become colored. Olive oil originally having an acidity of 2.256 per cent. (oleic acid), when thus treated, became reduced to 0.0287 per cent.; whereas by the process of the Fr. Ph. it retained an acidity of 1.692 per cent.—Pharm. Journ. and Pharmacist, Dec. 21, 1912, 781; from Bull. Soc. de Pharm. de Bor., 1912, 495.

Olive Oil—Examination of Forty-seven Samples.—J. R. Rippetoe and N. Smith have determined and record the specific gravity, saponification number, iodine number and free acid found in 47 commercial samples of olive oil, representing products from most countries upon which we depend for our supply. The iodine number being regarded as affording one of the best tests of purity of olive oil, it is noteworthy that quite a number of the samples, although complying in other respects with the official requirement and apparently of good quality, were found to be below 80, the U. S. P. demanding not less than 80 nor more than 88. The minimum found in the present examination was 77.4; the maximum 89.4; the average 80.9. The authors are of the opinion that the limit 80 is too high, and that oils of the best quality may be condemned if held to this requirement. They also believe it advisable to establish a limit for free acid in the U. S. P.—Amer. Journ. Pharm., April, 1912, 158-159.

LABIATÆ.

"*Lavandin*"—*An Undesirable Lavender-Hybrid*.—L. Lamothe calls attention to the increasing cultivation and utilization of a lavender-hybrid:

Lavandula fragrans \times *latifolia*, Chartinier—the result of a crossing of lavender and spike, which is known in Southern France by the name of "lavandin," and also by several others, such as "lavande bâtarde," "grosse lavande," "badasse," etc. It occurs principally in the region of the "holm-oak," even spreading over the boundaries of the latter, traversing in a broad belt the Departments of Drôme, Vaucluse, Basses-Alpes, etc., where it covers the southern slopes of several mountains up to the top. Like all hybrids, "lavandin" is an extraordinarily hardy plant, and its prolific development constitutes an actual danger to the true lavender, which it robs of air and nourishment. On account of its acrid odor and bitter taste, pasturing sheep and goats shun it, while they find in the true lavender an occasional welcome substitute for grass; but in spite of this, very considerable quantities of this hybrid are cut for distilling, and Lamothe estimates that the "lavandin oil" brought to market every year amounts to about 12,000 kilos, or to about 20 per cent. of the total output of lavender oil. It is interesting to note also that the same time and trouble that is required to collect 55 kilos of true lavender flowers, suffices to collect 400 kilos of "lavandin flowers," which, moreover, yield 1 kilo of oil from 77 to 80 kilos of flowers, whereas 145 kilos of true lavender flowers are required for 1 kilo of oil. As regards the quality, this can be judged from the fact that the average ester content of "lavandin oil" is 24 per cent., whereas a linalyl acetate content of 30 per cent. is considered low for true lavender oil.—Schimmel's Rep., April, 1912, 86-88; from *Parfumerie Moderne* 5 (1912), 9.

BORRAGINÆ.

Symphytum Officinale (*Comfrey*)—*Anatomy and Herbral History*.—At the suggestion of Dr. J. C. Macalister, of the Royal Southern Hospital, Liverpool, who has been engaged in experimental inquiries into the therapeutical value of certain substances in the treatment of malign and malignant ulcers, and had learned that infusions or poultices made from the "roots" of comfrey had been used in some parts of the country in this relation, Prof. R. J. Harvey-Gibson procured a large quantity of comfrey rhizomes, which were submitted to Dr. A. W. Titherley for analysis. This resulted, as described in a separate abstract (see *Allantoin*, under

"Organic Chemistry"), in the extraction in considerable amount of a crystalline body which was identified as allantoin, a substance by no means of common occurrence in plants. (It is regarded by plant physiologists as a derivative—probably an oxidation product—of nuclein, and has as yet only rarely been identified in plants.) The clinical aspect of the subject and the results obtained from the use of allantoin in specific cases are dealt with by Dr. Macalister in a paper published in the Brit. Med. Journ. and are briefly described in a separate abstract. Mr. Harvey-Gibson himself contributes an admirable historical summary of the drug, its reported virtues and uses from the time of Dioscorides to the time when, in the latter part of the eighteenth century its remedial value was discredited by Woodville (Medical Botany, 1794) and others. The author also describes the pharmacognostic characters of the drug, from which it appears that the dry material sold as the rhizome of *Symphytum officinale* contains the massive "root-stock" and roots indiscriminately.—Pharm. Journ. and Pharmacist, Jan. 27, 1912, 91.

Comfrey Rhizome—Allantoin the Active Constituent and a Valuable Healing Agent for Ulcers.—The researches of Dr. C. J. Macalister have succeeded in demonstrating that the high esteem in which Comfrey was held by our Saxon forefathers as a vulnerary healing agent was well justified. This action has been traced to allantoin, $C_4H_6N_4O_3$, of which the rhizome of *Symphytum officinale* has been found by Dr. Titherley and Mr. Coppin to contain about 0.8 per cent. Allantoin is found to act as a cell proliferant in a very remarkable manner. When applied to ulcers of various forms it has exercised powerful healing properties. It is applied as a dressing in the form of 0.3 to 0.4 per cent. solution. Internally, mucilaginous infusion of comfrey root, reinforced by allantoin solution, has cured an extremely severe case of gastric ulcer, and has been helpful in other instances of gastric and duodenal ulcers. The results already obtained with allantoin are sufficient to indicate that it will have a wide field of useful application.—Pharm. Journ. and Pharmacist, Jan. 27, 1912, 97; from Brit. Med. Journ., 1912, I, 10.

BIGNONIACEÆ.

Ipé Tobacco Wood—Proximate Examination.—This wood from a Bignonaceous plant, presumably *Tecoma chrysotricha* is used in Brazil in the form of sawdust as a surrogate for snuff; as for giving a yellow color to cotton stuff, and as lumber for building purposes. Oesterle has submitted it to chemical analysis, extracting it with

95 per cent. alcohol and again extracting the dry alcoholic extract with benzene, which dissolves not only the active coloring principle but also much resin which hinders crystallization. The resin can be precipitated from the benzene solution by addition of petroleum ether, but as the part still remaining in benzene solution proved on evaporation of the solvent to be a mixture, the residue was treated with sodium hydroxide which dissolved part of the crystals with a red color. From this alkaline solution, on acidulation, a yellow precipitate separated and this on repeated crystallization gave a compound melting at 142-143°, giving red color with alkalis, yellow red with concentrated sulphuric acid and orange red with glacial acetic acid. The colors produced by alkali are bleached by boiling with zinc dust and that with acetic acid is likewise bleached with tin and sulphuric acid. The compound on combustion showed composition $C_{15}H_{14}O_3$ and was therefore methoxy-free crysophanic acid as was first surmised, but was very similar to lapachol of Paterno and of Green and Hooker; this body having composition $C_{15}H_{14}O_3$ and melting at 139° to 140°. Conditionally, however, Oesterle calls his body *tecomin*. The portion of the benzene dry extract insoluble in alkali on repeated crystallizations from alcohol formed handsome bright yellow needles melting at 242°; while from the alcoholic mother liquor, light small crystals melting at 239°-240° were obtained. Because of lack of material, these two substances could not be fully investigated.—Schweiz. Wschr. f. Chem. u. Pharm., 1 (1912), No. 35, 529. (H. V. A.)

APOCYNACEÆ.

Gelsemium.—*Constituents*.—Charles Watson Moore (Wellcome Chemical Research Laboratories, London), has made a thorough investigation of the constituents of the dried rhizome and roots of *Gelsemium sempervisens*, Aiton, the results of which he summarizes as follows: An alcoholic extract of the drug when distilled with steam, yielded a small amount of an essential oil. The non-volatile constituents, as obtained after treating the alcoholic extract with steam, consisted of a brown resin insoluble in water, and material which remained dissolved in the cold aqueous liquid. The resin, amounting to about 3.8 per cent. of the drug, yielded: *Pentatriacontane*; traces of *emodin monomethyl ether*; a *phytosterol*, $C_{27}H_{46}O$ (m. p. 136°; $[\alpha] -40.4^\circ$); a small amount of *ipuranol*, $C_{23}H_{38}O_2 - (OH)_2$; and a mixture consisting of *palmitic*, *stearic*, *oleic*, and *linoleic acids*. The portion of the alcoholic extract of the drug which was soluble in water, contained: *Scopoletin* (a monomethyl ether

of æculetin), which was present in a free state, and also in the form of a *glucoside*, together with a quantity of *sugar*. It yielded, furthermore, three alkaloidal products, one of which, *gelsemine*, has been obtained in a pure state, melting considerably higher than has been hitherto recorded (178° , instead of 160°) and which has been conclusively shown to possess the formula $C_{20}H_{22}O_3N_2$. The other alkaloidal products, one of which corresponds with the so-called "gelseminine" of Thompson (Jahresber., 1887, 2218), and Cushny (Ber., 1893, 1725), were amorphous, and no crystalline derivative could be obtained from them.—Amer. Journ. Pharm., July, 1912, 305-317.

Gelsemium—Æsculin Not a Constituent.—O. Tunmann having proposed a method for the detection of æsculin by microsublimation, which he considers especially adapted to the identification of gelsemium, mentioning that æsculin under the condition of this test does not behave as it does under the conditions of an ordinary chemical experiment, Frank Tutin has made and describes experiments which prove the fallacy of Tunmann's assumption that the sublimate consists of æsculin and that, in fact, the sublimate obtained consists of scopoletin (=æsculetin 5-methyl ether), which is the fluorescent principle in gelsemium. In consideration of his doubts based on a number of facts mentioned, Mr. Tutin determined the behavior of anhydrous æsculin, æsculetin, scopoletin, and finely ground gelsemium on heating. Small quantities of these materials were placed in small, thin glass tubes, the open end sealed, and the substance simultaneously heated in a metal bath, the temperature of which was recorded by a thermometer placed in the liquid. At 140° the scopoletin just commenced to sublime, and at 150° a distinctly crystalline sublimate was obtained. The temperature was then raised to 170° , at which point it was kept for several hours. The scopoletin then sublimed fairly rapidly, yielding almost colorless, well-formed crystals. The gelsemium also yielded a small sublimate, which was, for the most part composed of crystals of scopoletin. The æsculin gradually melted, and darkened somewhat, slowly yielding a slight sublimate of tarry matter, containing no crystals. The æsculetin remained unchanged. The temperature was then raised to 210° , and again maintained several hours. The scopoletin fused, and sublimed rapidly; the gelsemium yielded a further sublimate, largely of tarry matter; æsculetin slowly sublimed in pale yellow crystals; the æsculin was decomposed, giving a further sublimate of tarry matter, together with crystals of æsculetin, the identity of which was proved by the melting point (264°).—Pharm. Journ.

and Pharmacist, Feb. 10, 1912, 157; from Wellcome Chem. Research Publications.

Oleander—Glucosidal Constituents.—Further investigation by A. Leulier has confirmed the existence, in all parts of the oleander plant, except in the latex, of a glucoside which is probably the substance named "neriin" by Schmiedeberg, who examined the plant in 1883, and isolated, besides this, the alkaloid oleandrine, and another glucoside, neriatin. On account of its strong chemical affinity to strophanthin, the author now describes his "neriin" as

Lævostrophanthin.—A solution of a few crystals of the glucoside in strong sulphuric acid is colored violet by contact with bromine vapor, or nitric fumes. The hydrolysis product of the glucoside gives similar reactions. It is very poisonous, the toxic dose ranging from 2 to 6 Mgm. per kilo. for the dog. The latex, both in summer and in autumn, although differing in character, contains another glucoside, distinct from lævostrophanthin. It crystallizes in needles from alcohol and from boiling water on cooling. After hydrolysis with dilute sulphuric acid, it reduces Fehling's reagent. The melting point is 179°-180° C. The hydrolysis product is also crystalline and very bitter. It decomposes at 230° C. without melting. Its color reactions are quite distinct from those of lævostrophanthin and it is much less toxic.—Pharm. Journ. and Pharmacist, Feb. 24, 1912, 249; from Journ. de Pharm. et Chim., 1912, 5, 108.

Strophanthus Courmontii—Relative Toxicity, Therapeutic Action, etc., of the Seeds.—Dr. Gordon Sharp describes some pharmacological experiments made with tincture prepared from the seeds of "Mandala Strophanthus" (*S. courmontii*, Sacl., var. *Kirkii*), in the same proportion as the B. P. tincture. While the active constituent of this variety of strophanthus is not definitely known, it is almost certainly a glucoside related to strophanthin, but perhaps more nearly to ouabain (pseudo-strophanthin), the glucoside yielded by *Acôkanthera schimperi*, A. DC, and by the Gaboon arrow poison. The experiments have demonstrated that while the lethal dose for frogs needs to be three or four times that of *S. Kombé*, the therapeutic dose of the tincture for man need not be more than three-fifths larger than that prepared from the official seeds. The author does not doubt that in the early days, when *Strophanthus* was new to practice, many of the successful results were obtained from tinctures made from these seeds, and his present investigation shows that the seeds of *S. courmontii* are far from inert.—Pharm. Journ. and Pharmacist, Feb. 10, 1912, 161-162.

Strophanthus Hispidus and *S. Kombé*.—*Pharmacological Identity of their Glucosidal Constituents*.—A. Heffter and Fr. Sachs have made comparative studies, partly of a chemical and partly of a pharmacological character, of the glucosidal constituents of the seeds of *Strophanthus hispidus* and of *Strophanthus Kombé*. The results have demonstrated that the active constituent of the hispidus seeds is an amorphous strophanthin, which is very closely related to the crystalline strophanthin of kombé seeds both as regards its chemical characters and its physiological action, but that a crystalline strophanthin was not obtainable from the hispidus seeds. While the two glucosides are thus differentiated by their physical (chemical) characters, their absolute identity in physiological activity can only be determined by extensive clinical observations, and the authors therefore are not prepared to recommend the substitution of the hispidus seeds for the kombé seeds at present official in the G. P. V.—Pharm. Ztg., lvii (1912), No. 39, 393; from Biochem. Ztschr. 40 (1912), No. 1 and 2.

Strophantus—Glucosides.—A. Heffter and Fr. Sachs have made comparative studies, chemically and pharmacologically, with the following results: The seeds of *Strophantus Kombé* contain a crystallized glucoside, Arnaud's Strophantin and the seeds of *Strophantus hispidus* contain an amorphous and no crystallized strophantin. Besides their physical and chemical difference both glucosides differ also pharmacologically, and the kombé seed should therefore not be replaced by the less active *Strophantus hispidus*.—Bioch. Ztsch., 1912, No. 1 and 2. (O. R.)

Strychnos Nux-vomica—Characters of the Fat of the Seed.—The fatty substance from the seed of *Strychnos nux-vomica* has already been examined by Schroeder and by Harvey and Wilkie, but as conclusions of these investigators concerning the unsaponifiable portion were somewhat vague, Heiduschka and Wallenreuter have studied the fat anew. They find the oil has a saponification number 124; Reichert-Meissl number 3.7; Hehner number 81; acid number 18.5 and iodine number 64 to 67. The unsaponifiable portion (some 20% of the total fat) has iodine number 45.4 after three hours, or 60.2 after 18 hours, and by treatment with hot acetic anhydride, colorless tabular crystals melting at 121° were obtained, having iodine number (after 20 hours) 57.2, showing the phytosterin reactions and the composition $C_{40}H_{70}O_2$. This proved to be an acetyl derivative which, on saponification, yielded a body $C_{38}H_{68}O$ melting at 99° , having iodine number (after 20 hours) 79.7, show-

ing the phytosterin reactions. From the impure acetyl mixture another body $C_{32}H_{54}O_2$ melting at 221° and showing phytosterin reactions was obtained and this on saponification yielded a body melting at 186° , which, however, was not obtained pure enough to secure uniform combustion figures. A third phytosterin body (m. p. 165°) was obtained in very small quantities when the total unsaponifiable part of the oil was extracted with 80% alcohol.—Arch. d. Pharm., 250 (1912), Nos. 5 and 6, 398 and 401. (H. V. A.)

SAPOTÆ.

Chicle Gum—*Source, Commerce and Composition*.—Bosz and Cohen have published a paper on this exudation, describing plant from which obtained and method of origin, data as to commerce (e. g., importation into the United States in 1904 was 5,450,139 pounds) and the manufacture and use of chewing gum. Incidentally, the writers find that one of the best known American brands contains 30% paraffin. They then take up the recent work of Schereschewski on chicle and compare his results with those obtained by them in their previous examination of balata. Schereschewski found in chicle α -chiclalban (m. p. $219-221^\circ$), β -chiclalban (m. p. 158°), δ -chiclalban (m. p. $86-87^\circ$), and lastly a body which he called chiclefluvil; the extraction being performed with boiling alcohol, followed by fractional crystallization. Bosz and Cohen repeat Schereschewski's work, submit the resultant products to more careful examination and combustion of the products and of their derivatives and state that α -chiclalban is really the acetate of α -amyrin $C_{30}H_{50}O$; that β -chiclalban is a mixture of the acetates, capronates and cinnamates of β -amyrin and of lupeol $C_{31}H_{50}O$; that δ -chiclalban is presumably β -cerotinon $C_{57}H_{114}O$ (see A 271 (1892), 221); and that chiclealban is a mixture of lupeol benzoate and several other bodies. They further find that saponification of chicle gives evidences of a volatile amino-base of cinnamic, capronic and oxalic acids.—Arch. d. Pharmazie 250 (1912), No. 1, 52. (H. V. A.)

STYRACEÆ.

Siam Benzoin—*Source and Method of Collection*.—The source of Siam benzoin is shown by Dr. Kerr in the Kew Bulletin (No. 9, 1912.) to be a new species—

Styrax benzoides, Craib. Dr. Kerr points out that the styrax tree which grows on Doi Sootep is not *Styrax Benzoin*, but a new species closely allied to *S. suberifolius*, and since described as *S. benzoides*. This tree grows rapidly, and attains a height of 12.15 M. and a

girth of 9 Dm., but most of the trees are smaller, though in other parts larger trees are reported. The matter has been confirmed by the receipt at Kew of a small sample of the gum collected from the Doi Sootep trees, which in smell, taste, and fumes is identical with commercial Siamese gum benzoin. It is a homogeneous, transparent, pale-amber piece, with the characteristic odor of the balsam. The principal method of collecting it consists in making V-shaped incisions through the bark; the gum runs slowly into bamboo joints placed at the bottom of the incision, requiring several weeks for completion. The collection is usually done during the hot season.—Pharm. Journ. and Trans., Dec. 21, 1912, 777.

Storax—Modification of Assay Process for Cinnamic Acid Content.—Referring to a recent article in "Perfumery and Essential Oils," in which, after drawing attention to the unsatisfactory quality of storax imported into England during the last decade, a process for the determination of the cinnamic acid content is given. C. A. Hill and T. T. Cockling suggest certain modifications of this process for reasons explained, and record figures for recently imported storax, showing that while genuine storax of excellent quality can still be obtained, other that come to the market is little better than rubbish. The modified process adopted by the authors is as follows:

Saponify 2.5 Gm. of the prepared storax by boiling with 25 Cc. of seminormal alcoholic potash and 20 Cc. of alcohol for one hour under a reflux condenser; evaporate the alcohol and dissolve the saponified mass in 50 Cc. of water.

Shake this aqueous solution with 20 Cc. of ether, allow to stand, and separate the ethereal layer; wash the latter with 5 Cc. of water, mix the washings with the aqueous solution, and reject the ethereal liquid.

Acidify the aqueous solution and extract the mixed cinnamic and resin acids by shaking out with ether four times. Transfer the ethereal solutions, after washing them with water, to a 200-Cc. flask, and distill off the ether. To the residue add 100 Cc. of water, connect the flask to a reflux condenser, and boil vigorously for fifteen minutes; pour off the hot liquor through a filter, allow to cool to 15°, and collect the crystals of cinnamic acid on a counterpoised filter. Repeat the extraction with the filtrate at least three times, or until no more cinnamic acid is obtained. Press the filter and crystals between blotting paper, and either dry *in vacuo* over sulphuric acid and weigh, or dissolve in alcohol and titrate with decinormal sodium hydroxide. To the result obtained add 0.03 Gm. for solubility of cinnamic acid in water.

Two samples from recent importations by the British Drug Houses, Ltd., showed: acid val., 112.2 and 113.1; ester val., 91.3 and 92.8; sapon. val., 203.6 and 205.9, and contained 5.07 per cent. resin acids and less than 5 per cent. of cinnamic acid. They were probably adulterated with resin as well as "impoverished" (by the abstraction of the odorous constituents); while five other samples from the same source (all of them separate consignments) gave the following constants, proving them to be genuine storax: Acid value, 58.3-76.4; ester value, 118.2-145.9; sapon. value, 194.6 to 204.2, respectively. The cinnamic acid content was: 30.68 per cent., 27.51 per cent., 22.25 per cent., 21.6 per cent. and 26.64 per cent.—Chem and Drug., Mar. 16, 1912, 412-413.

"Estoraque" or "Benjui"—An East Bolivian Incense Resin.—Hartwich and Wichmann have studied the resin known by the above names in East Bolivia where it is used as incense and also for smoking.

The two names mean Storax and Benzoin, respectively, and the resin examined exudes from the cuts made in the bark of the tree—*Styrax Pearcei*. Similar aromatic resins are obtained from several other species of *Styrax* growing in South America. This particular resin was studied by the writers both from chemical and botanical standpoints with the following results:

The resin occurs in grayish-brown to redish-brown, brittle masses, showing a glassy fracture. The odor is like benzoin but when pulverized is more like styrax, while the taste is resinous and scarcely aromatic. The resin is soluble in alcohol and chloroform and partly soluble in ether, gives aromatic sublimate, responds with permanganate to the cinnamic acid reaction and shows acid number 96.6, saponification number 195.15 (quite close to those of Sumatra benzoin).

Sixty Gm. of the resin were dissolved in 300 Gm. 96 per cent. alcohol, the insoluble part consisting of only impurities such as bark, hair, fungus, etc. The alcohol was distilled in vacuo and the residual red-brown resin was dissolved in 200 Cc. ether and the solution shaken with 5 per cent. sodium carbonate solution and then with 4 per cent. sodium hydroxide solution until no more resin was extracted (shown by end of precipitation on addition of acid). The shaken out ethereal solution on spontaneous evaporation left 2 Gm. of an aromatic oily liquid which tests showed contained *benzaldehyde* and traces of styracin.

The resin was precipitated from the warm alkaline solution with acid and after separation of the resin, the filtrate deposited crystals

of vanillin. On further standing, the acid filtrate deposited 7.5 Gm. of crystals, which proved to be *cinnamic acid* and some *benzoic acid*.

The resin obtained above weighed 36 Gm., was soluble in alkali, alcohol, chloroform and acetone and was insoluble in water, petroleum, ether, benzene, toluene and xylene. Thirty grammes of it treated by the method of Ludy (Arch. Pharm., 230 (1893), 43) yielded 1.3 benzoeresin $C_{16}H_{26}O_2$ and a resinotannol $C_{15}H_{17}O_4$ which the author calls Boli-resinotannol, since it is not identical with Ludy's resinotannol ($C_{18}H_{20}O_4$) from Sumatra Benzoin.

The botany of *Styrax Pearcei* was studied by examination of pieces of the bark left behind when the resin was dissolved in alcohol. These pieces under the microscope (picture in the original article) showed a secondary bark that was sometimes covered with cork and resembled in many respects the bark of *Styrax Benzoin*. It showed groups of dotted sclerenchyma showing fine radial markings; its parenchyma contained many calcium oxalate crystals adjacent to the sclerenchyma; its bast rays contain groups of thick-walled sieve tubes and short, much thickened dotted bast fibers, 36 microns wide and blunt at ends, either single or in small groups (not found in the bark of *Styrax benzoin*). The medullary rays are 1 to 2 cells broad with radially elongated cells in which are found columnar oxalate crystals (in *Styrax Benzoin* the medullary rays are about five cells wide). Finally the bark has occasional cavities which Wichmann does not believe (as does Ludy) is the place of origin of the resin, but merely spaces from which the stone cells have fallen. The resin, he claims, originates in the wood. Wichmann also examined a sample of "Estoraque" from *Styrax camporum* and the bark of the same tree, which likewise grows in East Bolivia. The resin resembles that from *Styrax Pearcei*, but contains no cinnamic acid, while the bark differs from that of the other species in the following ways: Medullary rays are broader (to 15 cells wide); the stone cells are limited to the outer half of the bark and are not so thick. The oxalate crystals are scattered through the parenchyma. The bast fibers are much thinner (18 microns wide), are longer (over 200 microns) and are pointed at the ends.—Schweiz. Wschr. f. Chem. u. Pharm. 1 (1912), No. 17, 237. (H. V. A.)

Storax—*New Method of Examination*.—Dr. C. Ahrens recommends and describes in minute detail a method for the examination of storax which depends upon the solubility of its essential constituents in petroleum benzin. The petroleum-benzin extract, carefully dried to constant weight according to specific directions, is a

light yellow, very thick liquid product, having an agreeable odor and strong refractive power. Adulteration with colophonium, if in large quantity, is recognized by the darker color and the odor of the extract, and the loss of its fluidity. The author gives directions for determining the acid and saponification values of this extract, but does not mention the percentage of extract yielded by normal storax, nor give the actual constants observed. He has made a series of examinations of commercial samples of storax and believes the method to be useful for detecting adulterations.—*Pharm. Ztg.*, lvii (1912), No. 65, 655; from *Ztschr. f. öff. Chem.*, 1912, No. 14.

ERICINEÆ.

Monotropa Hypopitys—A Saprophyte—Not a Parasite.—C. Queva communicates some interesting observations on the biology of *Monotropa Hypopitys*. Its roots are invariably enveloped in a felty layer of a fungoid mycelium, the filaments of which penetrate through the elements of the outer layer of the root and separate the cells laterally so that they form a kind of cuticular root sheath surrounding the whole root. In this space the filaments are regularly arranged parallel to the axis of the foot. Outside the sheath they are arranged irregularly in a felted mass. These filaments do not penetrate into the root of *Monotropa* beyond the external piliferous layer, and they do not interfere with the cells of this layer. In these masses of filaments there are always present the roots of other plants such as *Pinus*, *Picea* and *Carpinus*. These are surrounded by a mass of the same filaments, which often directly pass from these roots to that of *Monotropa*. In the coniferous roots, however, the mycelial filaments, instead of remaining in the piliferous layer, penetrate deeply in the root as far as the endoderm, and are scattered throughout the whole structure. *Monotropa* is evidently not a true parasite, since its roots are never found penetrating the tissues of the "hosts." It is a saprophyte, and it absorbs its nourishment through the mycelian tissue. The relationship between *Monotropa* and the mycelian tissue is one of symbiosis, and between that tissue and the roots of other trees one of parasitism.—*Pharm. Journ. and Pharmacist*, March 9, 1912, 319; from *Journ. de Pharm. et Chim.*, 1911, t. 514.

COMPOSITE.

Chicory—Physiological Action of the Infusion.—According to the physiological experiments of Dr. Pacchter the chicories possess a decided, although not very strong stimulant effect upon the diges-

tive apparatus, as well as upon the blood circulation. These properties, aside of the gustatory properties of the chicory infusion, account for its popular use as a beverage. Injurious effects upon the health when consumed in normal quantities are out of question, in the author's opinion.—Pharm. Ztg., lvii (1912), No. 30, 302; from Zschr. f. Unters. d. Nahr.-u. Genuesm., 1912, No. 6.

Dalmatian and Montenegrin Insect Powder—Method of Preparation from Wild Growing Flowers.—At the October session (1912) of the German Pharmaceutical Society, Jüttner gave an interesting description of a journey to Dalmatia and Montenegro, undertaken with the object of studying the methods of collecting the flowers and of preparing insect powder from them. He states that the flowers are collected from wild-growing plants, *chrysanthemum cineræfolium*, in large territories along the Dalmatian coast, and particularly on the small adjacent islands in the Adriatic, partly in small and partly in large quantities. No effort is made to cultivate the plants, except that now and then, to promote the growth of new plants, some comminuted flowers are spread out in localities where wild growing plants have their habitat. The collectors dispose of the fresh flowers to the dealers, who sun-dry them on mats spread out along the shore of the ocean, and then reduce them to powder for shipment—the principal market for the Dalmatian insect powder being Spalato, and the best quality that prepared from flowers grown on the small Adriatic islands. That grown on the mainland is mostly inferior in quality, while *Montenegrin Insect Powder*, which is produced in a limited extent only, has been proven to be of little value, notwithstanding the praise which has often been accorded to it. Both kinds of insect powder are exceedingly liable to be adulterated, the principal adulterant being the stems of the plant, which are ground, colored with chrome-yellow, and aromatized with powdered pepper.—Pharm. Ztg., lvii (1912), No. 81, 817.

Complementary to the above, Dr. P. Siedler called attention to the adulterants of insect powder and the method of their detection as well as for the valuation of the genuine drug.—Ibid., 817.

Insect Powder.—E. Jütner and P. Siedler, after a visit to Dalmatia and Montenegro, delivered several lectures before the Deutsche Pharmazeutische Gesellschaft in Berlin. The best insect powder is obtained from the closed flower heads of *chrysanthemum*

cinerariæfolium, while the open flower heads produce a less valuable powder. The three chief adulterants of insect powder are stems, other similar flowers and coloring. The moisture, according to Dietze, is from 3.42 to 9.85 per cent. The ash content of the closed flowers seems to be more than that of the open flowers and varies, according to Dietze, between 6.65 to 8.34. The extract content, according to Thoms, is 4 to 6 per cent., according to Dietze, 4.35 to 7.72, and according to Cæsar and Loretz, 6 to 9.5 per cent. The paper is illustrated with microscopic slides of the powder from the flower heads and also that of the stems.—Ph. Zhalle. 1912, 50, 1431 to 1435. (O. R.)

Taraxacum—Constituents.—Dr. F. B. Power of The Burroughs, Wellcome Research Laboratory read a paper on this subject before the Chemical Society, London. Besides inulin, resin and sugar no definite substances have been isolated. Polex (1839) obtained "taraxacin," a crystalline product and Kromayer (1861) extracted a waxlike substance "taraxacerin" $C_{40}H_{80}O_5$. Both these are indefinite mixtures. T. & H. Smith, of Edinburgh, (1849) proved that mannitol does not preexist in the root, but is formed through the mucous fermentation of the extract. Power found in air dried fresh English root a small amount of enzyme, essential oil, oily resin, fatty acids, including melissic acid, p-hydroxyphenylacetic acid, which was never before isolated from a plant, being a decomposition product of albuminous substances. On heating the aqueous extract with alkalis an ammoniacal odor of trimethylamine was developed, which caused the isolation of choline. As recently an English physician has successfully employed extract of taraxacum in the cancer treatment and a Heidelberg professor has advocated choline for the same purpose, therefore the discovery of choline in taraxacum will prove of interest chemically and pharmacologically.—Ch. and Dr., 1912, 822. (O. R.)

VALERIANACEÆ.

Fresh Valerian—Therapeutic Value.—J. Chevalier observes that the disrepute into which valerian has fallen as a nervous sedative is due entirely to the use of the dried drug. This is practically inert. But the fresh juice of the rhizome is a most valuable preparation. It may be given in doses of one to three teaspoonfuls, either alone or flavored. Since it contains no free valerianic acid, the taste is not disagreeable. For this reason the strong mother tincture, or alco-

holature of French pharmacy, has been both the most palatable and effective preparation of valerian, but it contains so much alcohol that its use is impossible in the majority of cases in which the sedative effects of valerian are required. A specially prepared juice, obtained from the roots of cultivated valerian, has been introduced under the name of

Energetene of Valerian.—This being prepared without heat and preserved without alcohol, is claimed to represent the natural fresh juice of the plant. Pouchet and Chevalier have found this preparation to be satisfactory. Pouchet has stated that any preparation of valerian which has a strong odor of valerianic acid should be regarded as therapeutically inactive. This acid is in itself quite devoid of therapeutic action. Even its salts, such as ammonium valerianate, have no action, apart from the stimulant action of the ammonium. The other valerianates act solely in a propulsive and psychic manner, chiefly on account of their repulsive odor and the preconceived ideas held as to their action. Valerian juice, on the other hand, has a very powerful sedative and anti-spasmodic action, and, at the same time, is a cardiac tonic, so that it appears to be simultaneously a stimulant and sedative. For young children it is the safest and best hypnotic. As the juice of valerian is quite nontoxic, it may be safely prescribed as a general nervous sedative.—Pharm. Journ. and Pharmacist, June 22, 1912, 807; from Nouv. Remèdes, 29 (1912), 169.

RUBIACEÆ.

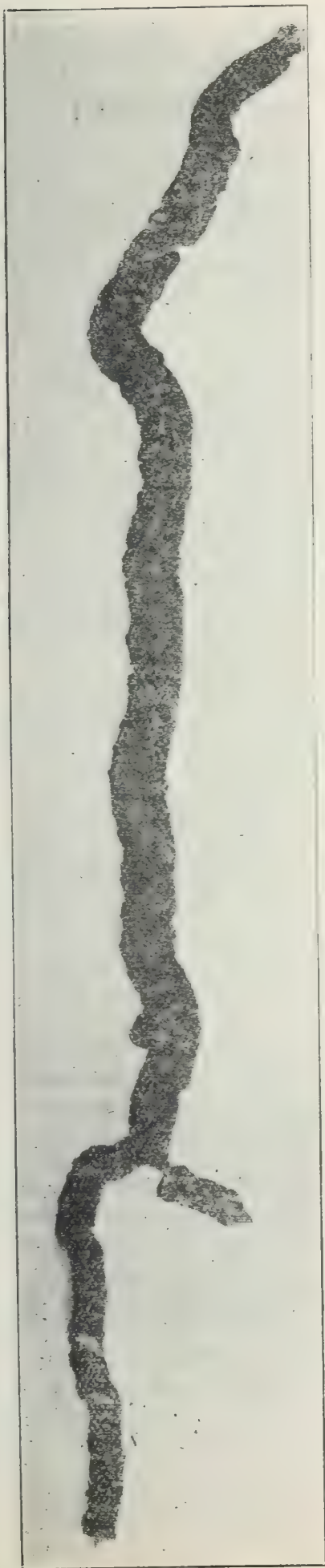
Coffea Arabica—The Fat of Roasted Coffee.—To prevent use of added fat in glazing roasted coffee, the Swiss food regulations direct that on maceration of the roasted bean with ether, the dried ethereal extract should not weigh more than 1.5 per cent. Dr. Verda, of Lugano, shows that strongly roasted coffee (black coffee) preferred by the people of the Canton of Tessin gives considerably more than the above amount of extract; samples of Equador, Santos, Porto Rico and Salvadore coffee roasted by the writer to the shade of "blackness" preferred in Lugano yielded from 2.98 to 4.08 per cent. of ether extract. He, therefore, thinks that the present regulations are too severe and that rather than amount of ethereal extract, the refractive index of same should be considered.—Schweiz. Wschr. f. Chem. u. Pharm., 1 (1912), No. 22, 326. (H. V. A.)

Cinchona and its Galenical Preparations.—H. P. Madsen and C. V. Dahlberg have come to the following conclusion: The fineness of powder does not make any difference in the alkaloidal assay. In extracting cinchona water will dissolve a limited amount of alkaloids and so will alcohol. The best menstruum for the preparation of tincture of cinchona is diluted (68%) alcohol. Percolation is superior to maceration. The deposit formed in the tincture does not diminish the alkaloidal strength. Decoctum chinæ acidum and extractum chinæ fluidum are the preparations which contain the most alkaloids.—Arch. Pharm. og Chem., 1912, No. 14. (O. R.)

Ipecacuanha—Glucosidal Constituent.—Some time ago the observation was made by H. Finemore and Dorothy Braithwaite that when ether is added to a concentrated alcoholic extract of Johore ipecacuanha a crytalline precipitate was produced, which proved to be a glucoside, and this precipitate the authors have since obtained (presumable of the same identity) from different specimens of Brazilian (Matto Grasso and Minas) ipecacuanha. In view of the limited knowledge regarding the non-alkaloidal constituents of the drug, the authors have subjected this glucoside, for which they propose the name

Ipecacuanhin, to nearer examination. When purified by recrystallization it forms tufts of colorless needles, sparingly soluble in cold, but readily soluble in hot water; it is practically insoluble in ether, sparingly soluble in chloroform, acetone, and ethyl acetate, but readily soluble in petroleum ether. It appears to be that constituent of ipecacuanha which gives a green color with ferric chloride, the green color being changed to a reddish-purple on addition of sodium carbonate. Ipecacuanhin is contained in the root to the extent of at least 0.4 per cent., and is apparently innocuous, having been introduced intravenously into rabbits in quantities up to 1 Gm. without apparent effect. It contains no nitrogen, and is possibly identical with the *ipecacuanhic acid* described by Willick (1850) as an amorphous product from ipecacuanha, to which he assigned the formula $C_{14}H_{18}O_7$. The authors find that ipecacuanhin may be hydrolyzed either by means of dilute acid or emulsin, and that it is a β -glucoside as revealed by the glucasazone obtainable by suitable treatment.—Trans. Brit. Pharm. Conf. (Yearbook of Pharm.) 1912, 496-498.

FIG. 43.



Johore Ipecacuanha.

Johore Ipecacuanha—Progress in Cultivation.—In striking evidence of the progress made in drug cultivation and its possibilities in the British Empire, the "Chemist and Druggist" reproduces in exact size of the original a photograph (Fig. 43) of official ipecacuanha grown in Johore. The sample was picked out of a consignment of 36 bales which had just arrived in London and were sold at satisfactory prices. The piece is $8\frac{1}{2}$ in. long over all, and has a maximum diameter of $\frac{5}{16}$ in., but it is evident that it is only a portion of a much longer root. The annulations are sufficiently marked to distinguish the specimen from Cartagena root, but they are not deep. Assayed in the laboratories of The British Drug Houses, Ltd., it has been found to yield 1.6 per cent. of total alkaloid, which is somewhat below the average—the first consignment of importance, consisting of ten bales, received in 1902, having been catalogued as containing 1.82 to 1.95 per cent. of alkaloids. This seems to bear out the contention that fine, bold root is not necessarily the best. On the other hand, the leaner root marketed of late years is not necessarily poorer in alkaloid, the record of 1907 showing that the alkaloidal content was practically unaltered. The cultivation of ipecacuanha is very slow work, and although it is said to grow well, it does not produce root in abundance. Nevertheless, it is believed that Johore ipecacuanha can compete with that of Matto Grosso, and can be cultivated for much less than the cost to collect and bring

the Brazilian drug to the coast.—Chem. & Drugg., Oct. 19, 1912, 615.

A False Ipecac from Colombia—*Pharmacognostic and Macroscopic Description*.—C Hartwich reports a new so-called ipecac which contains no alkaloid; hence is useless. It is 0.8 to 1.0 Cm. thick, black-brown externally, with yellowish wood. The bark is thinner than in the true ipecac and is devoid of the characteristic annulæ of the official variety, while the wood is correspondingly thicker (0.5 Cm.) Much of the bark is broken off (likely due to unequal drying), leaving characteristic fissures, and in some cases, bare wood. Anatomically, the bark shows first, a thin layer of dark brown cork with flat cells without very thick walls; second, a small phelloderm 1 to 4 cells thick, with thin-walled parenchyma containing amorphous inulin or similar carbohydrate, and also "rosettes" of calcium oxalate; third, inner layer of bark, radially striped sieve tubes, which on longitudinal section show oblique and calloused sieve-plates. These sieve tubes are found only in the inner layer but a short distance from the cambial layer. There are no sclerenchyma in the bark, but occasional lignified cells as shown by reference to phloroglucin—HCl reagent.

The wood layer is radial with medullary rays 1 to 2 cells broad and as much as 40 cells long, the cells being lignified, pitted and containing inulin as the only carbohydrate, and also calcium oxalate, both in large single crystals and in rosettes. The wood wedges contain, first, normal wood vessels, some as much as 81 microns in diameter and some filled with fungoid growth; second, wood vessels with branched ends; third, occasional tracheids; fourth, some parenchyma containing calcium oxalate "drusen"; fifth and chiefly, much thickened libriform fibres which reagents show are not lignified.

The author has not been able to exactly identify this new false ipecac, but comparison of it with the other so-called ipecacs leads him to the opinion that it comes from a plant of the Malpighiaceæ and that it closely resembles an illustration which Guibourt in his "Historie Naturelle des Drouges Simples" (1876) called "Ipecacuanha gris-blanc de Merat." The article closes with a classification of all the known ipecacs, including the one just described.—Schweiz. Wschr. f. Chem. u. Pharm. 1 (1912), No. 7, 93. (H. V. A.)

Ipecac in Dysentery.—Harvey G. Beck (J. Am. Med. Assoc., 1912, v. 59, pp. 2110-2114) presents a review of some of the literature on the treatment of dysentery by means of ipecac and reports a number of cases to show that ipecac, when administered through a duodenal tube, is distinctly more efficacious than when administered in any other way. (M. I. W.)

CAPRIFOLIACEÆ.

Diercilla Florida—*Narceine Among the Proximate Constituents of the Fruit*.—Lowell E. Dawson has made a proximate examination of the fruit of the "bush honeysuckle," *Diercilla Florida*, a shrub of China and Japan, cultivated in our gardens, the fruits examined being gathered at Lisbon, Iowa. The dark-red berries, resembling ripe currants in color, are very bitter and produce nausea when a small quantity are eaten. Two berries grow on a stem. They are quite juicy, and the yield is abundant. They yielded 38.04 per cent. of sugar, which was identified as fructose, 3.75 per cent. of fixed oil, difficult to saponify and seemingly belonging to the castor oil group; proteins corresponding in quantity to 2.86 per cent. of nitrogen; and 3.5 per cent. of ash. The acid tests revealed the presence of both tartaric and citric acid, but the most interesting observation was the presence of an alkaloid, which the author regards as being

Narceine, although he has not succeeded in isolating this alkaloid in a pure crystalline condition. The tests described by the author seem to confirm this assumption. While the quantity of this alkaloid has not been determined, it may exist in paying quantities in the fruit, if it should prove to be narceine.—Chem. News, July 12, 1912, 18-20.

UMBELLIFERÆ.

Asafetida—Valuation of the Drug on the Basis of the Oil and its Sulphur Content.—E. F. Harrison and P. A. W. Self, leaving out of consideration the ordinary method for the valuation of asafetida, depending on the determination of alcohol-soluble matter and ash, describe comprehensive researches, undertaken for the purpose of devising a reliable method for the detection of sophistications, accidental or intentional, of asafetida with other gum resin or resins, and to determine to what extent the volatile oil is to be considered the sole, or only, contributory active constituent of the drug. The authors designate their very voluminous paper as a "preliminary report," and this is probably justified in so far that they have not definitely solved the problem undertaken. Nevertheless, it is replete with information and suggestions of practical value, while the direction in which the valuation of the drug may be most efficiently conducted, is clearly pointed out by the results obtained and recorded. These results are exhibited in a number of tables, showing the constants obtained in the examination of fifteen commercial samples, representing the different grades of asafetida usually found on the market—the essential parts of these tables being here reproduced and rearranged in a single table, as follows:

Table I					Table II			Table III			
Sample	Nature	Loss on Drying	Resin	Oil	Ash	Sp. Gr. of Oil at 15.5°	Ref. Index of Oil at 20°	Rotation of Oil	Percentage of S. in Oil	Sulphur in Oil, as Percentage of Drug	Sulphur in Oil, as Percentage of real Gum-resin
1	Fine tears	12.2	62.3	11.0	1.6	0.976	1.5200	-10° 16'	28.2	3.10	3.16
2	Fine tears	18.0	59.7	16.4	1.4	0.975	1.5152	-9° 0'	21.6	3.54	3.59
3	Large tears	14.7	58.6	9.4	6.7	0.917	1.4952	+6° 58'	19.3	1.81	1.93
4	Tears and mass	11.4	64.0	5.8	3.4	0.981	1.5207	-9° 30'	29.2	1.69	1.75
5	Tears	11.7	45.3	10.1	27.0	0.915	1.4942	+9° 39'	17.5	1.77	2.42
6	Tears (from Bombay)	9.7	28.9	7.2	32.6	0.993	1.5250	-35° 55'	37.8	2.72	4.01
7	Soft mass	18.2	55.8	11.1	9.2	0.918	1.4980	+0° 50'	20.8	2.31	2.54
8	Soft mass	22.3	56.3	15.7	4.9	0.920	1.4978	+4° 40'	19.7	3.09	3.25
9	Conglomerate	13.0	51.3	9.6	10.3	0.925	1.4993	+4° 32'	21.6	2.07	2.31
10	Conglomerate	9.8	63.7	7.3	3.2	0.957	1.5077	-17° 3'	19.9	1.45	1.49
11	Mixed	15.7	39.2	14.1	23.9	0.923	1.4985	—	—	—	—
12	Mixed	19.4	47.8	16.7	6.2	0.927	1.4982	—	—	—	—
13	Mixed	17.4	36.9	11.9	22.9	0.930	1.4997	—	—	—	—
14	Mixed	19.3	48.0	14.1	9.4	0.930	1.4987	—	—	—	—
15	Mixed	22.3	50.1	17.1	4.3	0.929	1.4999	—	—	—	—

In the above table, the columns indicated as taken from table 2, show that high percentage of sulphur in oil goes with high specific gravity, high refractive index, and levorotation, while the lowest percentage of sulphur goes with lowest specific gravity and refractive index, and the highest dextrorotation. It is evident from these characters of the oils that the variations in sulphur content are at least largely due to variations in the amount of sulphur—free constituents, chiefly terpenes, and differences in the percentage of oil in the drug may also be chiefly due to the presence of more or less of these terpenes. So that, for example, if one sample of asafetida yields 10 per cent. of oil containing 30 per cent. of sulphur, and another sample yields 15 per cent. of oil, containing only 20 per cent. of sulphur, the two drugs are identical in so far as volatile sulphur compound are concerned, and only differ in the amount of terpenes also present. And since it is the drugs, and not the oils, that are to be compared, the sulphur of the volatile oil should be calculated as a percentage of the drug, or of the true (actual) gum resin. These figures are given in the last two columns of the above table indicated as taken from table 3.

There seems good reason to believe that the virtues of asafetida are chiefly due, not merely to the essential oil, but to the sulphur-containing constituents of the volatile oil. The figures given by the authors not alone offer an excellent criterion of quality, but enable the detection of adulteration with foreign gum resins. As such, olibanum, galbanum, and ammoniacum have been mentioned by Dr. Wiley and by Dr. H. H. Rusby as occurring in parcels of asafetida offered for entry in the U. S. Customs Department. These gum resins yield volatile oils which contain no sulphur, and if present as adulterant of asafetida, would naturally reduce the sulphur content of that drug. But the authors suggest that when the amount of sulphur present in the oil is not below 1.5 per cent. of the real gum resin in the sample, there is a *prima facie* case for regarding the drug as genuine.—Pharm. Journ. and Pharmacist, Feb. 17, 1912, 205-209.

Asafetida—Gross Adulteration with Mineral Matter.—Supplementary to their previous paper (see above), E. F. Harrison and P. A. W. Self record the characters of eleven additional samples of asafetida, selected from the contents of some hundreds of cases, on arrival in London, and of two small samples (tears) sent from

America, where they were picked out in examining a consignment of the drug on behalf of the customs department and regarded with suspicion. The London samples are described as "mixed," "soft paste," "soft mass," "soft conglomerate," "hard mass" (or "rock"), and "large tears." Three of the samples were adulterated with mineral matter to the amount of 43.7, 46.1 and 52.6 per cent., and there was considerable variation in the oil content of all of them (from 4.6 to 19.6 per cent.), but all of them gave the characteristic color-reaction with sulphuric acid followed by water, indicating true asafetida, and there was no evidence of adulteration, either with ammoniac or galbanum. The two American samples contained 17.1 and 20.8 per cent. respectively, of volatile oil, the first giving the color reaction very strongly, the other very faintly. These results, which are exhibited along with other constants in form of a table, were obtained by the methods of analysis described in the previous paper. The authors also mention two samples not included in the above. One of them contained 73.2 per cent. of ash and 19 per cent. of water, and consisted almost entirely of gypsum, only 7.0 per cent. being soluble in alcohol, yet had a fairly strong odor of asafetida. The other was in tears of fairly good appearance, containing 80.8 per cent. of mineral matter, and evidently consisted of gypsum thinly coated with gum resin.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1912, 417-422.

Asafetida—Adulterations—Plea for the Establishment of a Separate Standard for Powdered Asafetida.—Asafetida is one of the most grossly adulterated drugs imported into the country, says Arthur W. Reum, the foreign material giving high ash and small resin tests. Great variety of color is noticeable in the original cases, some tears are nearly white or cream color, others are brown, and the whole mass frequently streaked and spotted with red, and on some occasions, blue dye. The light colored portions are soft and sticky and are commonly wrapped in coarse cloth or the skins of animals. The dark colored portions are hard and brittle. Wood, gypsum and earthy matter may be found in the mass. Pieces of a root resembling sumbul, several inches long and from one to two inches in diameter, were found in some cases. Analysis made of a sample received in a granular condition, dark in color and very hard, gave an ash content of 65 per cent., due to a large amount of mineral substance, and only 11 per cent. of alcohol soluble resin. Six analyses of samples taken from original cases gave the following results:

	Alcohol Solubility	Ash
1.....	33.80%	10.8%
2.....	28.60%
3.....	38.40%	9.5%
4.....	39.10%	14.7%
5.....	50.98%	31.0%
6.....	53.47%	28.4%

A fairly reliable method for the selection of a sample which shall represent accurately the resin and ash content is to select three or four samples, each comprising six to a dozen different parts of the entire mass. These samples may be well mixed and the assay made from the mixture, or each may be assayed separately, and the results averaged.

For the alcohol extraction, a weighed quantity may be placed on counter-balanced filter papers and washed with hot alcohol to exhaustion; the residue then dried and weighed. Or 10 Gm. of the drug may be placed in a shell and extracted in a continuous extraction apparatus, and the dried residue then weighed. In grinding asafetida, from 30 per cent. to 50 per cent. of drying material, such as starch, is added. This reduces alcohol solubility but does materially affect the ash. Ten assayed samples containing starch gave alcohol soluble material as follows: 17.5 per cent., 37.4 per cent., 22.1 per cent., 19.3 per cent., 20.7 per cent., 23.8 per cent., 18.8 per cent., 19.3 per cent., 11.3 per cent., 14.5 per cent. The ash ranged from 9.2 per cent. to 25.7 per cent., with only two below 15 per cent. It is not possible to have the powdered drug answer the requirements of the whole drug, hence it would be well to establish a special standard for the powder, it being extensively used in condition powders and stock foods.—Pac. Pharm., Sept., 1912, 118-119. (C. M. S.)

Asafetida—Detection of Adulteration with other Gum Resins.—The determination of alcohol-soluble resins and of ash in asafetida does not reveal the presence of cheaper gum-resins as adulterants. These are best detected, according to Sachler and Becker, by distilling off and examining the volatile oil. Asafetida oil is perfectly colorless; ammoniac oil is dark yellow, and galbanum oil light yellow. If, therefore, the distillate shows even traces of color, adulteration with one or the other of these gum resins is indicated. Moreover, the index of refraction of asafetida oil at 25° is 1.4974; if, in examination, the number falls below 1.4960, the asafetida is adulterated.—Pharm Ztg. lvii (1912), No. 31, 310; from Gehe's Rep., 1912.

Asafetida—Detection of Ammoniac and Galbanum as Adulterants.

—The liability of adulteration of asafetida with the cheaper gum resins—ammoniac and galbanum—has prompted a series of experiments in the analytical laboratory of Smith, Kline and French Co., which were carried out by H. M. Sechler and M. Becker, with the object of determining reliable methods for the detection of these adulterants. Comparative experiments were made with 10 per cent. emulsion of the pure gum resins and with asafetida which had been mixed with 20 per cent. of ammoniac in one example and with 20 per cent. galbanum in another, and with these a number of color reactions were obtained, which promise to be serviceable for the intended purpose. They are:

(1) *The Hypobromide Test*, which differentiates ammoniac from both asafetida and galbanum or their mixtures, giving an olive green color with the latter, while with ammoniac emulsion a cherry red was produced, and with emulsion of asafetida with ammoniac a distinct transient red when the reagent (composed of 40 Gm. sodium hydroxide, 10 Cc. bromine and water to make 200 Cc.) was added.

(2) *The Sulphuric Acid Test*, consisting of the addition of 30 drops of cold concentrated H_2SO_4 to 2 Cc. of the respective emulsions, which produced no perceptible change with asafetida, nor with ammoniac emulsion, but with galbanum emulsion produced a reddish violet color.

The authors also distilled the volatile oils from samples of the same materials by steam distillation. They all had the odor of the material. They differed, however, in color and consistency—the asafetida oil being colorless, while the ammoniac oil was dark yellow (and quite viscous) and the galbanum oil light yellow. Distillates from asafetida should, therefore, be regarded with suspicion if any color is perceptible in them.

The determinations of the refractive indices of the distillates also show appreciable differences, that of asafetida being 1.4974, of ammoniac, 1.4765, and of galbanum, 1.4840. The authors conclude that a refractive index of less than 1.4960 be considered with suspicion, and that the simple color tests mentioned will indicate the presence of at least 10 per cent. of the adulteration in asafetida.—*Amer. Journ. Pharm.*, Jan., 1912, 4-7.

Ammoniac, Galbanum and Elemi—Yield and Characters of Volatile Oils.—It has been stated that ammoniac, galbanum and elemi are employed as adulterants of asafetida, and in consideration of how far the characters of asafetida oil could be used as a criterion

of the purity of this drug (see *Asafetida*), it was considered expedient by E. F. Harrison and P. W. Self to ascertain the amount and characters of the volatile oil contained in these gum resins in order to determine the influence of their presence on the characters of the distillate from *asafetida*.

Oil of Ammonicum.—Seven samples of ammoniac from consignments recently received in London, representing different grades (conglomerate mass, tears, large and small, loose and partly aggregated into masses) were examined, all of them giving the characteristic red color for ammoniac with sodium hypobromite. The yield of oil ranged from 0.08 to 0.20 per cent., and the index of refraction from 1.4747 to 1.4806. It follows that a considerable addition of ammoniac to *asafetida* would materially reduce the yield of oil, but since the yield of oil from *asafetida* is very variable (as shown in the article on *asafetida* above referred to), this would be of little value for the detection of ammoniac, the best test, probably, being at present the hypobromite test.

Oil of Galbanum.—This was distilled from two samples and showed the following yield and constants, respectively: Yield, 10.3 and 11.4 per cent.; sp. gr., 0.908 and 0.955; index of refraction, 1.4856 and 1.4863; opt. rotation, $+15^{\circ} 14'$ and $+7^{\circ} 30'$.

Oil of Elemi, distilled from a single sample, was obtained in a yield of 9.6 per cent. and showed the following constants: Sp. gr., 0.904; index of refraction, 1.4869; opt. rotation, $+38^{\circ} 22'$.

The addition of galbanum or elemi to *asafetida* would markedly lower the specific gravity and refractive index of oil of *asafetida*, and increase its dextro-, or reduce its lævo-rotation.—*Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy)*, 1912, 430-431.

Gum-Resins—Method of Determining Residue Insoluble in Hot Alcohol.—Dr. E. Büttner recommends for the determination of the portion of gum-resins insoluble in hot alcohol, that the drug be extracted in an apparatus similar in construction to a Soxhlet, which usually permits complete extraction in the course of 2 to 3 hours with the use of a nominal quantity of alcohol. The process of extraction may be regarded as complete when the alcohol passes colorless. The drug is primarily weighed at 100° , and again after extraction and drying in the exsicator.—*Pharm. Ztg. lvii* (1912), No. 37, 373; from *Südd. Apoth.-Ztg.*, 1912, No. 34.

Embalming Resins of the Ancients.—A. Tschirch describes the chemical work done on this topic for inclusion in L. Reutter's book "*L'embaumement avant et apres Jésus-Christ*." After outlining prior

work done on embalming balsam and emphasizing that the only way to determine the constituents of resinous masses was by the isolation and identification of characteristic ingredients (e. g., the masticinic acids from the mastic; halepopinic acid from Aleppo resin; cinnamic acid and vanillin from storax) he gives details of Reutter's analysis, for which the reader is referred to the original paper. Six masses of resin were examined:

(1) An Egyptian resin of the XXX Dynasty (4th century B. C.), consisting of mastic, aleppo resin (from *Pinus halepensis*), asphalt, Chiosturpentine, cedar resin, sugar, "natron" (carbonate, chloride and sulphate of sodium and potassium), but no myrrh, opopanax, umbelliferous gum-resins, euphorbium, benzoin, nor sandarac.

(2) Resin from an embalmed ibis, which contained storax, asphalt, a tar, mucilage yielding mucic acid on oxidation with nitric acid, mecca balsam, sugar, "natron," but no myrrh, olibanum, benzoin, galbanum, asafetida nor Gurjun balsam.

(3) Resin from an Egyptian funeral urn, containing Gurjun balsam (probably), asphalt, sugar, "natron," but no myrrh, storax, benzoin, sandarac, coniferous resins, olibanum nor mastic.

(4) Resin from the necropolis of Carthage (6th century B. C.), containing mastic, Aleppo resin, sandarac, asphalt, perfume (steam distillation gave thymol reactions and a distinct menthol odor), but no "natron," olibanum, myrrh, benzoin, chiosturpentine nor umbelliferous gum resins.

(5) A second resin from Carthage like "4," except it also contained olibanum.

(6) A Phœnician resin which contained amber among other ingredients.

Tschirch calls attention to the remarkable fact that sugar (evidently from the palm wine used by the Egyptian embalmers), thymol, vanillin and cinnamic acid should have withstood the vicissitudes of 3000 years and give the same physical data and chemical reactions of our samples of today.—*Arch. d. Pharm.*, 250 (1912), No. 3, 170. (H. V. A.)

RANUNCULACEÆ.

Japanese Aconite Root—*Botanical Source*.—At the meeting of the British Pharmaceutical Conference, 1912, Mr. E. M. Holmes contributed an exhaustive research regarding the botanical source of Japanese aconite root, which, as is well known, is referred in most text-books to *Aconitum Fischeri*. The results of his research, which is given in great detail, lead him to the belief that this reference is

incorrect. He says there is so little known of the aconites cultivated for ornament or medicinal use in Japan that it is not astonishing if an error should have occurred. Even the illustrations of *Aconitum Fischeri* in native Japanese works on botany appear to represent different species, and the specimens in the British national herbaria apparently also represent several species under one name. The author's present researches, however, leave but little doubt that the bulk of Japanese aconite root of English commerce is the produce of *Aconitum uncinatum*, var. *Japonicum*, Regel, and that possibly mixed with it occur the roots of "Dzuru or Tsuru torikabuto," which has been identified by Dr. Shimoyama as the *Aconitum volubile*, Pallas. Either to this plant or to *Aconitum Napellus*, apparently, belong the roots with a stellate medullium found in Japanese aconite. But while there seems to be some confusion between the two twining plants, *A. volubile* and *A. uncinatum* var. *Japonicum*, there is no doubt in Mr. Holmes' mind that the Japanese aconite is derived from both these species.—Trans. Brit. Pharm. Conf. (Year-book of Pharmacy), 1912, 514-521.

Adonis Vernalis—*Glucosidal Constituents*.—J. M. Fuckelman has determined the presence of two glucosidal bodies in all extracts obtained from *Adonis vernalis*, as well as in the old and new adonidin supplied by Merck. These glucosides have a cardiac action similar to that of digitalis, and consist of a neutral body, for which the author retains the name "adonidin", and an acid body, which he names

Adonidic Acid. The two glucosides are separated from each other by adding bromine water and a few drops of a mineral acid to their solution, whereby adonidic acid is precipitated, while neutral adonidic remains in solution. The cardiac action of the two glucosides is very similar, but adonidic acid possesses also hæmolytic activity, while adonidin does not. The two glucosides are also differentiated by their color reaction and by their respective solubilities in ether-alcohol.—Pharm. Ztg. lvii (1912), No. 16, 156; from the Author's Inaugural dissertation, Rostock.

Aralia Japonica—*A New Glucoside from the Leaves*.—According to L. Danzel, the fresh leaves of *Aralia japonica* (the *Aralia sieboldii* of horticulture) contain glucose and a glucoside, aralin, which is insoluble in water, and is not hydrolysed by emulsin. They contain no water-soluble glucoside. Aralin is extracted by digesting the material in boiling alcohol (96 per cent.), filtering while hot, and diluting with water to about 85 per cent. of alcohol. On stand-

ing, the impure glucoside is thrown down. It is collected, dried and washed with ether, then further purified by re-solution in hot alcohol and reprecipitation. It is finally purified by recrystallization from hot 96 per cent. alcohol. It then occurs as a colorless transparent crystalline mass; melting at 260°C ; $\alpha\text{D} +52.5^{\circ}$ in alcoholic solution; almost insoluble in most organic solvents except strong alcohol and acetic ether. It contains no nitrogen. When hydrolysed with dilute sulphuric acid it forms insoluble aralidin and glucose. Aralidin separates from alcohol as a very hard, white, crystalline mass, melting at $246\text{--}248^{\circ}\text{C}$. It is an acid, combining with alkali carbonates. Aralin appears to be closely allied to hederin, the glucoside of ivy, which belongs to the same natural order.—Pharm. Journ. and Pharmacist, Aug. 3, 1912, 160; from Journ. de Pharm. et Chim., 1912, 5, 530.

Coptis Root—*Source and Constituents of Two Kinds Used in India*.—David Hooper states that coptis root as used in India, is obtained from two sources. The first is collected in the Mishmi mountains north-east of Assam, and is derived from *Coptis Tecta*, Wallich. The second kind of root is imported into Bombay from Japan and China, the latter probably being derived from *Coptis Tecta*, var. *Chinensis*, while it is conjectured that the Japanese drug is the root of *Coptis anemonapolia*, Sieb. et Luce. There are slight differences between the two kinds of drug met with in the Indian bazaars. "Mishmi tita" from Assam is a yellowish-brown rhizome, as thick as a quill or larger, having wiry rootlets or spiny projections where they have been broken off; the rhizome is jointed and frequently contorted, at the upper end the joints become much more marked, and one or more stem-clasping petioles often remain attached. A transverse section shows a thin brownish-yellow bark, with bright, orange colored, waxy segments of wood. The overseas drug brought to Bombay is more slender, of a light brown color, with fewer wiry rootlets; the rhizome often branches at the crown into two or three heads, which terminate in tufts of leaf-stalks crowded together and not separate as in the Assam drug. A transverse section shows a thick brown bark, with dull, yellowish-brown waxy segments. Both roots are extremely bitter and communicate a yellow color to water.

The Assam drug is the kind preferred and commands a much higher price than the Bombay drug. The drug has been analyzed by J. Dyce Perrins as far back as 1862, who reported a yield of $8\frac{1}{2}$ per cent. of berberine in a sample derived from *Coptis Tecta*. This statement has remained unchallenged during all the years

since, and Mr. Hooper has therefore subjected samples of the drugs from Assam and from Bombay to chemical examination, with the following results:

	Assam	Bombay
Moisture	8.9	7.7
Ash	3.1	3.3
Alcoholic extract.....	17.95	17.30
Resin	1.5	2.7
Berberine (as iodide).....	7.63	7.17
Berberine (as hydrochloride).....	8.6	8.3

The alkaloid was determined by calculating from the absolutely dried iodide, $C_{20}H_{17}NO_4 \cdot HI$, and the air-dried hydrochloride, $C_{20}H_{17}NO_4 \cdot HCl \cdot 2H_2O$. While the analysis points to the Assam root as a slightly better drug, it does not warrant any serious difference being made between the commercial valuation or medicinal reputation of the two kinds.—Pharm. Journ. and Pharmacist, April 13, 1912, 482.

Hydrastis—*Review of the Facts Concerning Hydrastis Culture*.—Prof. John Uri Lloyd contributes an article on the possibilities of *Hydrastis* culture based on his personal experimentation, and corroborated by other experimenters known to him personally. With his usual thoroughness he preliminarily reviews the principal facts known in regard to the drug, the English synonyms by which it is known, the native distribution of the plant, the botanical and pharmacognostic features of the plant and the drug, its commercial history, and gives a particular description of the botanical characteristics of the rhizome and rootlets that are concerned in the propagation of the plant, these special features being illustrated by numerous cuts. In support of his own views and description of the method to be followed for successfully cultivating *hydrastis*, Professor Lloyd quotes interesting letters received from Dr. H. T. Grime, of New Carlisle, Indiana, and from Dr. G. W. Homsher, of Camden, Ohio, both of whom have a practical experience in *Hydrastis* culture, and half-tone picture showing the woodland plantation of Dr. G. W. Homsher testify to the possibilities of a profitable investment, as well as a pleasant avocational side issue for doctors, druggists and others in rural sections. They find that *Hydrastis Canadensis* can be easily cultivated, and Dr. Grime demonstrates:

1. That *Hydrastis* can be propagated by hot-house methods as a quick-starter.
2. That the rhizomes, transferred to artificially enriched soil, in a garden shaded by bean and grape vines and a

few trees, grew more rapidly than the wild plants. 3. That *Hydrastis* rapidly depletes the soil, even though it be very rich.

Professor Lloyd concludes that while a deeply shaded natural woodland is ideal, a rich, loamy garden, shaded, will answer every purpose. The greatest trouble with woodland cultivation comes from the poacher, who considers everything that grows in the woodlands free, and who loses no opportunity to encroach upon the property of his neighbors, this being particularly true at the present high price of *Hydrastis*.—*Journ. Amer. Pharm. Assoc.*, January, 1912, 5-12.

Hydrastis—Cultivation.—The presumption that *Hydrastis* is practically extinct in many localities led J. L. Stingel (Cleveland School of Pharmacy) to undertake its cultivation under domesticated conditions. In order to secure plants it became necessary to search nearby forests. This he did in early spring as soon as the plants attained a sufficient growth to recognize them. In this way he was able to secure plants in surprising number in localities which have been gone over frequently, later in the season, in previous years, but nothing of any consequence was ever found. The raising of this plant is not difficult. The condition in which it exists in its native haunts would undoubtedly be the one to follow, although this is not necessary. Shade is an important factor; one-third sunlight when artificial means (lattice work) is used gives good results. He concludes that the scarcity of this drug cannot be attributed to lack of plants or extinction, but to other conditions, which tend to prevent identification at the time of collection. The only feasible solution to the present "*Hydrastis* problem," in the author's opinion, lies in cultivation.—*Amer. Journ. Pharm.*, July, 1912, 299-300.

Hydrastis—Comparative Alkaloidal Strength of Rootlets and Rhizome.—To determine the comparative alkaloidal strength of the rootlets and rhizome, Charles H. LaWall made a careful test of a lot of *Hydrastis Canadensis*. The lot weighed ninety-eight pounds and furnished 45.5 pounds of Rhizomes and 48 pounds of Rootlets, the balance being waste. Upon assay the rhizomes assayed 2.48 per cent. and the rootlets 1.38 per cent. *Hydrastis* rhizomes are therefore, according to his analysis, 1.5 to 2 times as rich in hydrastine as the rootlets.—*Proc. Penn. Phar. Assoc.*, 1912, pp. 142-143. (E. C. M.)

MENISPERMACEÆ.

Parcira Brava—Alkaloidal Constituents.—M. Scholtze publishes a critique of a paper on this topic by Faltis (*Monatsheft f. Chem.*, 33—1912—873), correcting by past experiments and some just carried

out several of Faltis' conclusions; notably that the latter's isobebeerine is not $C_{21}H_{23}O_4$, but is $C_{17}H_{19}NO_3$.—Arch. d. Pharm., 250 (1912), 684. (H. V. A.)

RUTACEÆ.

Angustura Bark and Buchu Leaves—Botanical Source and Nomenclature of Plants Yielding Them.—In a note on the "Botany of Medicinal Plants," Professor W. Y. Young interestingly traces the source of the drugs known in medicine respectively under the names of angustura bark and of buchu leaves, points out the confusion concerning the origin of the botanical titles of the plants yielding them, and gives a list of the synonyms found for these plants, together with the authority and the place and date of publication as far as known. The paper does not admit of condensation and must therefore be consulted in the original.—Amer. Journ. Pharm., June, 1912, 256-262.

Bael Fruit—Presence of Starch.—In the microscopical examination of a powder believed to be entirely or in part composed of bael fruit, J. C. Shenstone was struck with the presence of some tissues which, while resembling the tissues of bael fruit in other respects were loaded with starch grains. Upon referring to descriptions of bael fruit by such careful observers as Flückiger and Hanbury, Dymock, Warden, Hooper, etc., no reference was found to starch grains in bael fruit. The author therefore considered it desirable to examine a number of samples of the fruit, and discovered that whilst bael fruit is mostly composed of tissues devoid of starch, specimens often occur the cells of which are laden with starch grains. These starch grains are characteristic, being oval compound grains, varying considerably in size, from 0.0063 to 0.013 Mmm. and 0.005 to 0.01 Mmm. in breadth. The grains escaping from the cells usually divide in halves along their narrow diameter, each portion resembling a half-egg in shape. These grains respond to the usual chemical and optical tests for starch. Bael fruit offered upon the market varies considerably in size, from 1.5 to 3.5 inches. The specimens in which starch-laden tissue was discovered were from 2.5 to 3.75 inches in diameter. It is likely that the fruit is gathered at varying periods of unripeness, and should subsequent examination show that starch grains are only found in fruits of a certain stage of growth, we may conclude that starch is deposited to provide nourishment for the final effort in the ripening of the fruit.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1912, 504-506.

Barosma Pegleræ.—*A New Buchu from South Africa*.—Specimens of a buchu sent to Kew by Miss Alice Pegler from the grassy slopes at the Qolora Mouth, Kentani, in the eastern regions of the Cape Colony, appear to be new to science, and are described by R. A. Dümmer as derived from a *Barosma* (*B. pegleræ*, Stürm-ener). It is a perennial plant developing annual leafy and flowering shoots from a woody root-stock. The leaves are alternately disposed or sub-opposite, subimbricate or spreading, very shortly petiolate, oblong-elliptic, with an obtuse gland-tipped apex, $2/5$ to over $1/2$ in. long, $1/6$ to $1/5$ in. broad, leathery, glabrous, shiny, light-green; slightly convex and smooth above with a scarcely prominent midrib, paler below, with a few scattered inconspicuous glands, the margin slightly thickened and secured, almost entire, and impressedly glandular. The species exhibits an affinity to forms of *Barosma lanceolata*, Sonder, but is readily distinguished by the broader, elliptic leaves, which are, moreover, inconspicuously glandular on their lower surfaces.—Pharm. Journ. and Pharmacist, Nov. 16, 1912; 613; from Kew Bulletin, Nov. 7, 1912, 326.

Klip Buchu.—*Occurrence in our Commerce as an Adulterant of Buchu, U. S. P.*—Klip Buchu leaves, *Adenandra fragrans*, has been found in quantities of 17 per cent. in the long buchu of our market, by Prof. William Mansfield, of Columbia University. Klip Buchu grows in the same region as the official buchu and therefore is gathered by the laborers who are employed to gather that drug. It is in such cases as these that the pharmacognosist plays his part. In fact, it is just beginning to be recognized by dealers in drugs that a pharmacognostic examination of drugs of a vegetable origin, whether in the whole or in the powdered form is absolutely necessary to determine the botanical origin, to guard against the mistakes of collectors and accidental or intentional adulteration.—Proc. N. Y. Pharm. Assoc., 1912, pp. 297-303. (E. C. M.)

Clausena Anisum-olens.—*Yield and Character of Volatile Oil*.—Brooks obtained from the leaves of this Philippine *Rutacea* a colorless volatile oil in a yield of 1.16 per cent. It consisted to the amount of from 90 to 95 per cent. of methylchavicol (identified by oxidation into homoanisic acid—m. p. 84° to 86°), and gave the following constants: Sp. gr. $\frac{30^{\circ}}{30^{\circ}}$, 0.963; opt. rot., ± 0 ; refr. index, 1.5235; sap. val., 3.6. The author mentions that certain kinds of cigarettes made in the Philippines are scented with the leaves of this plant.—Shimmel's Rep., April, 1912, 54; from Philippine Journ. Sc. 6, A., 344.

Fagara Xanthoxyloides, Lam.—*Chemical Constituents of the Fruits*.—Having recently received from German Togo a quantity of the root, bark, and fruits of *Fagara Xanthoxyloides*, Lam., which are used there as a remedy for diseases of women, Professor H. Thomas, assisted by his pupil, H. Priess, has subjected this material to chemical examination. From the fruits a volatile oil was distilled, which was found to contain dipentene, methyl-n-nonyl ketone, caproic acid, acetic acid (in the form of an ester), linalool, a sesquiterpene, and a crystallisable substance of the formula $C_{12}H_{18}O_4$. This crystalline substance was found in larger quantity in the residue left after the distillation had been completed; it proved on examination to be a powerful fish-poison, and was therefore named xanthotoxin. Xanthotoxin melts at 145° - 146° , is a lactone, and contains a methoxy group. Further investigation showed that it was not only isomeric with bergaptene, but contained the same groups of atoms. It is, however, a pyrogallol derivative yielding pyrogallolcarbonic acid, $C_6H_2(OH)_3COOH$ [1, 2, 3, 4], when carefully fused with caustic potash, whereas bergaptene is a phloroglucin derivative. From the constitution of xanthotoxin, as indicated by the chemical composition and behavior, it must be regarded a methoxy derivative of cumarin-cumarone-pyrogallol. The constitution of bergaptene is not yet definitely known, but the author is now engaged in attempting to elucidate its constitution.—*Pharm. Journ. and Pharmacist*, Jan. 13, 1912, 29.

Simaruba Bark—*Pharmacopœial Recognition*.—Professor Falk discusses the pharmacopœial history of simaruba bark, calling attention to its inclusion among the drugs of the new German Pharmacopœia. He then considers the pharmacognostical description of the bark as given in the last German Pharmacopœia, comparing this description with those given in the works on pharmacognosy of Berg, Henkel and Wiegand. He then reports results of his own examination of seven samples of simaruba bark obtained through ordinary commercial channels, furnishing illustrations and showing wherein these barks differed from the authorities above cited. He finds the characteristic features of the several barks are, absence or presence of corky layer, presence or absence of starch granules and size of same; shape and size of crystals in the various cells and also size and shape of the stone cells. He claims that the specifications of the German Pharmacopœia permit only Orinoco simaruba and deprecates insufficiency of the present pharmacopœial description and especially the absence of a description of the powder.—*Arch. d. Pharm.*, 250 (1912), No. 1, 45. (H. V. A.)

STERCULIACEÆ.

Kola—Determination of Caffeine in its Preparations.—The method of the French Pharmacopœia for the determination of caffeine in extract of kola, and other galenicals of the drug, consists in extracting the dry, powdered material mixed with magnesia, by hot chloroform. According to G. Mellièrè the method is tedious, and in many cases complete removal of the alkaloid is unattainable. The following method obviates these defects. At the same time by employing a feeble alkali and adding sugar, the formation of an intractible emulsion is avoided. The dry residue of 20 Gms. of liquid extract, or 2.5 Gms. of solid extract, is dissolved with heat in about 25 Cc. of simple syrup. The solution is transferred to a 250 Cc. separator and treated with 2.5 Gms. of potassium bicarbonate. Brisk effervescence may ensue; but this quickly disappears on adding chloroform. The mixture is then shaken out with ten to twenty times its volume of chloroform added, and separated in portions. The bulked chloroformic solutions are then set aside, filtered, and distilled to a small volume. The residue is transferred to a small tared capsule, evaporated, dried and weighed. In the case of saccharine granules and similar sugar preparations, 25 Gms. of the material, dissolved in 10 Cc. of water, is treated as above, without the addition of more sugar. The amount of sugar present may be determined in a separate portion, to give an approximation of the quantity present. Some saccharine preparations contain artificial coloring; in this case the chloroform residue may be extracted with amyl alcohol. Natural kola coloring may be distinguished from aniline colors by the fact that it is removed by chloroform from both acid and alkaline aqueous solutions.—Pharm. Journ. and Pharmacist, May 18, 1912, 647; from Journ. de Pharm. et Chim., 1912, 438.

TERNSTROMIACEÆ.

Chinese Tea—Abnormal Sorts.—A contributor of the "Pharm. Zeitung," speaking over the signature "DC" of the change in the kind and quality of teas on the market, observes that at the present time the tea imported from China consists of leaves which are much larger than those of the genuine teas formerly supplied. He suspects that this tea is mixed with the small leaves of *Fragaria vesca* and with small digitalis leaves—from *Digitalis purpurea* or *D. lutea*, which would account for the depression of the heart's action and persistent diuresis following, in his experience, the use of Chinese teas as a daily beverage.—Pharm. Ztg., lvii (1912), No. 35, 353.

AMPELIDEÆ.

Virginia Creeper—Poisonous Properties of the Fruit.—The death of a child after eating the berries of the Virginia creeper (*Parthenocissus quinquefolia* L., Planchon—better known as *Ampelopsis quinquefolia*, Michaux), furnishes the incentive to a short paper with numerous bibliographical references, by L. E. Warren. It appears from the record in an Oregon paper, that the child was taken violently ill without any assignable cause and died after a short time. Examination of the child's vomitus revealed the presence of a large quantity of the berries from the plant mentioned, leading to the conclusion that this fruit was the probable cause of illness—this view being further supported by a report from the city milk chemist, of Portland, that the feeding of a dozen of the fresh berries to a healthy guinea pig resulted in the death of the animal in 36 hours. An examination of the fruit of this plant by Gorup-Besanez, in 1874, proved the presence of large quantities of oxalic acid, and a more recent analysis by Poyneer and Duffin (1909) has confirmed this fact. As oxalic acid is dangerously toxic (60 grains having caused the death of a human being), Mr. Warren considers it quite possible that this constituent of the fruit was responsible for the death of the child. His attempt to get further information concerning the symptoms from the physicians interested in the case, yielded no evidence upon which to base undisputable conclusions; but pending further investigations the attention of gardeners, householders and physicians is called by the author to the suspicious character of the Virginia creeper.—Amer. Journ. Pharm., Feb., 1912, 51-53.

VITACEÆ.

The Vine in Culture and Medicine.—An interesting historical review of G. Ekert, of the grape, the wines prepared therefrom and the products of the vine other than wine that have been used in medicine. Among the products cited are raisins, currants, oil of grape seed, the sour juice (or omphacium), extract of young shoots and tendrils and "lacrimæ vitis," the sap exuding in spring from the wounded stalk.—Schweiz. Wschr. f. Chem. u. Pharm., 1 (1912), Nos. 25 and 26, 369 and 385. (H. V. A.)

Wine—Indirect Determination of the Extract.—According to the researches of C. v. d. Heide and Edw. Schwenk, the constituents of wine undergo during the evaporation in the direct extract determinations a number of variable changes, so that the values ascertained are not comparable with each other in different wines.

They therefore recommend an indirect method for extract determinations in wines, which is based on the specific gravity of the wine ascertained before and after distilling off the alcohol—the extract in the wine being calculated by the aid of the saccharine table from the specific gravity of the portion remaining after the removal of the alcohol. For the purpose of control the accuracy of the three specific gravity determinations is confirmed by the application of Tabarić's formula, an error of ± 0.0003 being allowable.—Pharm. Ztg., lvii (1902), No. 56, 563; from Ztschr. f. anal. Chem., 1912, Nos. 7 and 8.

Wines—Determination of Glycerin.—Constantin Beis recommends the following method for the determination of glycerin in wines: 100 Cc. of the wine are neutralized with barium hydrate and concentrated until a syrup is obtained. This syrup is mixed with sand, and the glycerin is extracted by means of acetone. The acetone extraction is divided into two parts and evaporated. In one residue the sugar is determined with Fehling's solution, while the other residue is dissolved in five times its weight of water and powdered barium hydroxide is added. After the solution containing the $\text{Ba}(\text{OH})_2$ has been allowed to stand for some time, sand is added, and it is extracted with acetone at 50° . By evaporating the total filtrate at 50° the glycerin is obtained.—Chem. News, Aug. 9, 1912, 72; from Bull. Soc. Chim. de France, xi-xii (1912), No. 12.

Wines—Presence of Arsenic and Lead in Dregs.—P. Carles and L. Barthe find that when the vines of the grape are treated with an excess of lead arsenate, the wines obtained from the grapes contain negligible traces of arsenic and lead; but if the vines are treated with a normal amount of lead arsenate neither arsenic nor lead can be detected in the wines. In both cases, however, the dregs contain quantities of arsenic and lead which are not negligible.—Chem. News, July 5, 1912, 12; from Bull. Soc. Chim. de France, xi-xii (1912), No. 8.

Wine—Detection of Small Quantities of Zinc.—In the preparation of certain wines, clarification is facilitated by the addition of potassium ferrocyanide and a zinc salt. Small amounts of zinc may remain in the finished product and A. Straub recommends the following procedure for its recognition: 100-200 Cc. of the wine is heated to boiling, hot sodium carbonate solution is added and the mixture heated for some time. The resulting precipitate is filtered off and well washed with hot water, care being taken to avoid loss of precipitate. The residue is dissolved in the smallest possible quan-

tity of hydrochloric acid, a few crystals of potassium chlorate are added, and the liquid boiled until all the free chlorine is expelled. Excess of sodium acetate is then added and the liquid heated strongly to precipitate any iron or aluminum hydroxide or calcium phosphate. Zinc may then be detected in the filtered liquid by means of hydrogen sulphide. Pharm. Journ. and Pharmacist, May 25, 1912, 689; from Ztschr. f. Unters. d. Nahr. u. Genussm., 1912, 140.

HIPPOCRATIACEÆ.

Minjak Lagam—*Botanical Source*.—According to the researches of L. van Itallie and M. Kerbosch, two kinds of balsam have been known by the name of "Minjak Lagam," the one liquid, the other of ointment-like consistence. The liquid balsam is said to be derived from *Canarium cupteron*, Mig., but it is probable that in reality it is obtained from a species of *Dipterocarpus*. It is composed to the amount of 50 per cent. of caryophyllen. The ointment-like "Minjak Lagam" is derived from *Dipterocarpus Hasseltii*, Bl. and D., and *D. trinervis*, Bl. This balsam is composed to the amount of 10-22 per cent. of a volatile oil consisting mainly of caryophyllen, and contains a handsomely crystallizable phytosterol—"dipterocarpol" which has the formula $C_{27}H_{46}O_2$. By acetic acid anhydride 1 Mol. of water is split off from this phytosterol, and the anhydride $C_{27}H_{44}O$ is formed, and by oxidation with chromic acid mixture the keton $C_{27}H_{44}O_3$ is produced.—Arch. d. Pharm., 1912, No. 3.

Bolivian Tanning Barks—*Pharmacognostic Description*.—Hartwich and Wichmann report on the following rinds:

1. The bark of *Byrsonima cydoniaefolia*, var. *chiquitensis*, known in Bolivia as Mureci. This occurs in curved pieces 3 to 5 Cm. wide and 6 to 8 Mm. thick and some 20 Cm. long. It has papery bright gray cork and occasionally yellow lichens, and shows smooth, transverse and longitudinal fissures. The inner surface is yellow brown, longitudinally striate. The bark gives fibrous fracture and its taste is strongly astringent. The microscope shows the following structure:

(a) The cork consist of 20 to 50 layers of tangential cells with thin side walls and thick inner walls. Their red-brown contents give tannin reaction; (b) 5 to 15 phelloderm layers containing yellow-brown substance; (c) primary bark consisting of parenchyma with striate and dotted walls, containing rhombohedric crystals of calcium oxalate, some as large as 25 microns. Interspersed with the parenchyma are groups of stone cells; (d) secondary bark, the medullary rays of which are about 3 cells wide and 10 to 20 cells

high, containing calcium oxalate crystals. Throughout the tissue are found starch grains, weakly excentric, vaguely layered and about 25 microns wide. The bark contains 20 per cent. of tannin which blues iron salts, and gives a yellow-brown to rose color with KOH.

The bark of *Byrsonima spicata* known in the Antilles as merisier d'or and mourailler was reported by J. Moeller in 1882. This differs from the bark, just described in the several following points:

	Moeller's Bark	Hartwich's Bark
Stone cells of primary rind.	Thickened on one side.	Uniformly thickened
Bast consists of.....	Fibers and stone cells.	Lumen is visible.
Bast fibers.....	Cells cubical.	Cells radially extended.
Medullary rays.....	Crystals only near the fiber groups.	Distributed through the rays.

2. The bark of *Piptadenia macrocarpa*, known in Bolivia as curupa-y. This forms flat 5 to 7 Mm. thick pieces, some places having a gray-white smooth coating; in other places show red-brown cork; while in other places are covered with lichens. The inner surface is bright grayish brown and longitudinally striate. The fracture is hard and pulverulent for about 1 to 2 Mm., while the rest is somewhat fibrous. Bark is odorless, astringent and somewhat sticky on chewing.

Under the microscope the bark shows (a) an outer layer of wax; (b) 10 to 40 layers of small longitudinally elongated cork cells, with thick walls and with lumen containing tannin; (c) phelloderm of 3 or 4 rows of quadrangular cells containing oxalate crystals and granules; (d) primary bark consisting of 35 to 40 rows of thin walled parenchyma containing oxalate crystals and granules; (e) a ring of sclerenchyma 15 to 20 cells thick, the cells being tangentially elongated, with walls so thick that the lumen is frequently missing, and with walls perforated with single and branched pore canals. On the other side of the sclerenchyma ring is a single layer of parenchyma with large single crystals of oxalate which also are occasionally found between the stone cells themselves; (f) secondary bark containing some stone cells, but chiefly composed of tangentially elongated bast fibers 1000 microns long and about 10 microns thick. Interspersed with these are thick walled, somewhat obliterated sieve tubes and some fibers with lumen containing single crystals of oxalate; (g) the parenchyma of the secondary bark is thin walled, slightly pitted, the medullary rays being 1 to 4

cells wide and 10 to 35 cells high. The parenchyma cells of the entire bark contain starch granules, some over 7 microns broad and 14 microns long; some club shaped 7 microns broad and 25 microns long. The wax covering of the bark was completely soluble in chloroform, petroleum, ether, benzene, oil of turpentine, carbon disulphide and hot alcohol. Its behavior when melted and when sublimed under reduced pressure, shows it similar to the wax from *Myrica* and *Rhus* species and it constitutes sufficient part of the small sample examined by the writer to justify the hope that it may eventually be of a source of commercial vegetable wax. The bark also assays 18.3 per cent. tannin.

3. The third bark examined was one used by Chiquitos Indians as hemostatic but of unknown botanical origin. The writers give anatomical description of this bark and find that it contains 5.6 per cent. tannin.

The article is illustrated by cuts showing structure of all three barks.—*Schweiz. Wschr. f. Chem. u. Pharm.* 1 (1912), No. 24, 353. (H. V. A.)

PAPAVERACEÆ.

Formosa Opium—Characters.—K. Dieterich reports the results of a chemical examination of these authentic specimens of Formosa opium, received from Dr. Ishizu, the Japanese Commissioner having charge of the Japan Division of the International Hygienic Exhibition. These opiums were, unlike the ordinary opiums, apparently obtained by a method of extraction, and therefore essentially extracts of opium, but inferior not alone to extracts of opium obtained from the drug but to the drug itself. The three samples were identical in appearance, of a brown-black color, thick-liquid, extract-like, and in odor resembled the ordinary extract. Under the lens they were shown to be free from the plant-elements that characterize ordinary opium. Subjected to analyses by two of his chemists (Weinhagen and Mix) the results were as follows:

	No. 1	No. 2	No. 3
Moisture	24.37	20.68	25.96
Ash	3.58	3.74	2.55
Water soluble substance dried at 100°.....	64.14	61.26	63.56
Morphine content.....	5.27	7.55	5.71

The presence of meconic acid was determined in each of the samples.—*Pharm. Zentralh.* liii (1912), No. 5, 114.

Opium—Suggested Modifications in the Assay.—Mr. R. Norris Shreve states that the U. S. P. method of assay for opium gives inaccurate results, due to (1) incomplete extraction of the opium.

(2) retention of morphine by the mother liquor during precipitation, (3) inaccuracies in the lime water method for determination of the impurities in the precipitated morphine.

Shreve suggests that in view of the difficulty of extracting opium by the U. S. P. method (only about $\frac{2}{3}$ of the morphine present being removed by gentle mechanical shaking for eight hours, on three out of four samples) that a test for the completeness of extraction be given in the U. S. P.

It was found that considerable morphine is retained by the mother liquor in the U. S. P. method, and a table is given showing the amount retained at different temperatures. It was also found that the extractive matter in the mother liquor serves to hold back more morphine than is represented by the solvent action of the solvents themselves.

It is suggested that the purity of the crude morphine be determined by the Mallinckrodt re-assay method.—*Journ. Ind. & Eng. Chem.*, July, 1912, Vol. 4, p. 514. (L. A. B.)

Opium—Commendable Criticism of the Assay Process of the G. P. V.—Gehe & Co. speak commendably of the return to normal ammonia solution in the G. P. V. assay process for precipitating narceine, narcotine and papaverine in the solution instead of precipitating them by means of sodium salicylate solution. The quantity of normal ammonia solution directed is such that these weak bases are precipitated, with the exception of a little narcotine, leaving the morphine in solution; but it is important that the ammoniacal liquid be at once filtered. The rest of the narcotine is then precipitated with the morphine from the filtrate by the 5 Cc. of $\frac{1}{10}$ N. ammonia solution, and is removed from the precipitate by means of acetic ether—the last traces being removed from the morphine by washing with water saturated with acetic ether. In this way the total morphine completely freed from narcotine is obtained by the improved method of assay.—*Pharm. Ztg.*, lvii (1912), No. 31, 310; from Gehe's Rep., 1912.

Opium—Effect of Age on its Morphine Content.—Debourdeaux finds that in powdered opium the amount of morphine compounds insoluble in water apparently increases with the age of the sample. There seems to be no definite connection, however, between the amount of change in different samples; it is greater in certain samples than in others, kept under similar conditions, and is doubtless due to a chemical modification of the composition of the mass. In the same manner the amount of total morphine lessens with the age of the sample, and this deterioration, again, is more marked

in some cases than in others. It is probably due to the action of oxydase ferments, and is favored by the presence of air.—Pharm. Journ. and Pharmacist, Dec. 21, 1912, 781; from Journ. de Pharm. et Chim., 1912, 6, 491.

Opium—Pharmacology of Smoking.—In a paper read at the Jubilium meeting of German Chemists, on the pharmacology of "Opium Smoking," Dr. Straub refers the intoxicating effect produced by smoking opium to small quantities of morphine which are volatilized with the smoke.—Pharm. Ztg., lvii (1912), No. 46, 459.

Opium-Smoke—Morphine the Active Constituent.—Biochemical experiments made by Paul Pott confirms the observation of Straub recently communicated before the convention of German Chemists (see preceding abstract) that the intoxicating effects of opium smoke are attributable to morphine, the indubitable presence of which was demonstrated by its characteristic effect upon the respiratory center in the case of rabbits and by the morphine reaction of Straub on mice. The observation has the additional interest that the sublimation of morphine may also be effected *ex vacuo*.—Pharm. Ztg., lvii (1912), No. 57, 574.

Opium—Morphine in Smoke.—An editorial (J. A. M. Assoc., 1912, v. 59, p. 726), calls attention to the work by Pott of the Pharmacologic Institute in Freiburg, showing that morphine can be sublimed unchanged, and therefore can actually be present in opium smoke. Pott has succeeded in demonstrating that the action of smoked opium is due to the presence of undecomposed morphine in the smoke. (M. I. W.)

Opium and Preparations—Necessity of Leeway in Alkaloidal Content.—Felix Pancier, as a result of numerous assays of opium, powdered and extract of opium and tinctures of opium of the French Codex, 1908, reaches the conclusion that an upper and lower limit of the percentage of morphine should be adopted. This is especially true of Tincture Opii Crocata or Laudanum de Sydenham which even if prepared *lege artis* will only contain 0.7 to 0.8 instead of 1 per cent.—Bull. Sc. Pharm., 1911, 449. (O. R.)

Opium Deodoratum.—William K. Ilhardt, St. Louis, says that in preparing deodorized opium, ether dissolves more coloring matter and resins than benzin. Benzin dissolved 8.6 to 9.5 per cent., while the ether-soluble matter amounted to 12 per cent. A preliminary test of the ether extract showed but a small amount of morphine present. Attempts to determine the loss of morphine by assay be-

fore and after its deodorization were not satisfactory. The averages of two lots are as follows:

Sample A assayed 12.1 per cent. before, 13.4 per cent. after.

Sample B assayed 12.6 per cent. before, 12.84 per cent. after.

The relative value of ether and benzin should be thoroughly studied, and should ether be found to dissolve too much of the desirable constituents of the opium and benzin less, then the use of the latter should be continued; on the other hand ether appears preferable since it removes more matter than benzin.—Proc. Missouri Pharm. Assoc., 1912, 113-114. (E. C. M.)

CRUCIFERÆ.

Black Mustard Seeds—Alleged Deficiency in Myrosin.—As well known, black mustard seeds contain a glucoside, sinigrin, and an enzyme, myrosin—the latter, acting upon the sinigrin in the presence of water, decomposing it with formation of volatile oil of mustard (allyl isothiocyanate). The statement has been frequently made that these seeds do not always contain sufficient myrosin to decompose all the sinigrin they contain, and that, to effect this, white mustard seeds, which contain an excess of myrosin, must be added to them. Prof. Henry C. Greenish in collaboration with Miss Dorothy J. Bartlett, has now made a comprehensive series of experiments, to ascertain to what extent, if any, this statement is correct, and as a result of their experiments, which are described in detail, they have arrived at the following conclusions:

1. That in all black mustard seeds examined there is sufficient myrosin to decompose all the sinigrin present.

2. That in two of the samples examined there is sufficient myrosin to decompose a much larger quantity of sinigrin than the seeds themselves contain.

3. That if properly preserved, black mustard seeds retain their myrosin for many years.—Pharm. Journ. and Pharmacist, Feb. 17, 1912, 203-205.

Mustard Seeds—Fixed and Volatile Oils in the Different Commercial Sorts.—Dr. Clemens Grimms makes an exhaustive report of an examination of the different varieties of mustard seed, with particular reference to their fixed oil content extractable by ether, and the amount of volatile oil obtainable from the residues of extraction, these determinations being effected on seven varieties occurring in the Hamburg trade, namely:

1. Black or Brown Mustard (*Brassica nigra*, Koch.)

2. Sarepta (Russian) Mustard (*Brassica juncea*, Hook. f. et Thomson.)
3. Field Mustard (*Sinapis arvensis*, L.)
4. Yellow (or white) Mustard (*Sinapis alba*, L.)
5. Chinese Mustard (*Sinapis chinensis*, L.)
6. Split-leaved Mustard (*Sinapis dissecta*, L.)
7. Wild (or Hedge) Mustard (*Eruca sativa*, Lmk.)

In each case the physical and chemical constants of the fixed oils are given as obtained by the author, together with those obtained previously by other authors, when such are available. These may be consulted in the original; it must suffice here to give the percentages of fixed oil extracted by ether, and of the volatile oils obtainable from the residue of the extraction, the latter being also calculated for the entire seed, as shown in the following table:

Seed of	Fixed Oil extracted by ether	Volatile Oil in residue of extraction	Volatile Oil in the entire seed
<i>Brassica nigra</i>	28.3 p. c.	1.388 p. c.	0.995 p. c.
“ <i>juncea</i>	33.3 p. c.	1.705 p. c.	1.137 p. c.
<i>Sinapis arvensis</i>	26.7 p. c.	1.308 p. c.	0.959 p. c.
“ <i>alba</i>	28.1 p. c.	1.150 p. c.	0.827 p. c.
“ <i>chinensis</i>	30.4 p. c.	2.022 p. c.	1.407 p. c.
“ <i>dissecta</i>	27.6 p. c.	1.150 p. c.	0.833 p. c.
<i>Eruca sativa</i>	32.2 p. c.	1.586 p. c.	1.075 p. c.

—Pharm. Ztg., lvii (1912), No. 52, 520-521.

Mustard Seed—Advantageous Method of Estimating the Volatile Oil.—D. Raquet's investigations go to establish the advantage of alcoholic over aqueous maceration in determinations of the volatile oil in mustard seed. Into a 250 Cc. flask he places 5 Gm. of the powdered seed with 100 Cc. of water and 20 Cc. of 90 per cent. alcohol. The flask is closed and heated during one hour to a temperature of 30°-35°, or it is allowed to stand for six hours with frequent shaking. Distillation is then effected from a glycerin bath, the distillate being collected in a 100 Cc. flask, containing 10 Cc. of ammonia of sp. gr. at 15°, 0.925, until about 50 Cc. has distilled over. The distillate is then diluted with 20 Cc. of N/10 silver nitrate solution and, after shaking, the distillation is continued to the 100 Cc. mark. The distillate is now heated under a reflux condenser at 80°-85° for one hour, allowed to cool, adjusted to 100 Cc. and filtered through chlorine-free paper. Of this filtrate, 50 Cc. is titrated as usual with N/10 ammonium sulphocyanide solution. If

N = the number of Cc. used, and $10 - N$ = the number of Cc. of $N/10$ silver solution, then $(10 - N) \cdot 0.198$ = the quantity of allyl-isosulphocyanate yield by 100 Gm. of the mustard seed. By this method, English mustard seed was found to contain 1.386 per cent.; Greek, 1.198 per cent.; mustard seed from Merville, 1.08 per cent.; Sicilian, 0.99 per cent.; Bari mustard seed, 0.99 per cent.; and Bombay mustard seed, 0.81 per cent. of allyl-isosulphocyanate.—Schimmel's Rep., Oct. 1912, 82; from Ann. Chim. Analyt. Appl., 17 (1912), 174, through Chem. Zentralbl., 1912, II, 457.

In lieu of the usual methods used in the determination of allyl-isosulphocyanate in preparations of mustard, which he rejects, H. Penau proposes either to weigh in the form of silver chloride the silver which has entered into the reaction, or to titrate it with decinormal silver solution after adding an excess of cyanide of potash. —Ibid. from Journ. de Pharm. et Chim., vii, 6 (1912), 160.

Mustard Meal—Estimation of Volatile Oil.—A. Bontron has made a series of investigations to ascertain the cause of conflicting results obtained in determinations of volatile oil in powdered mustard. His experiments extended to modifications of the amount of water, the addition of more or less olive oil or alcohol in the distillation, the raising or lowering of the temperature of the glycerin-bath, and the time consumed in the distillation, etc. In general, 5 (or 10) Gm. of the mustard meal were placed into a stoppered Erlenmeyer flask of 250 Cc. capacity with 100 Cc. of water, shaken frequently during an hour and then set aside over night. Olive oil and alcohol were then added, and the mixture distilled in a glycerin-bath, the distillate being collected in a 100 Cc. flask containing 10 Cc. of ammonia water and 10 (or 20) Cc. of $N/10$ silver nitrate solution until 100 Cc. of distillate were obtained. The receiver was then stoppered, well shaken, set aside 24 hours, filtered and the excess of silver nitrate determined in 50 Cc. of the filtrate. Concordant results were obtained by K. Dietrich's method, which consists in washing the precipitated Ag_2S with alcohol, then with ether, drying and weighing.

The results of the author's investigations essentially demonstrates that if a distilling vessel of 250 Cc. capacity is employed, the glycerin-bath maintained at 110° to 115° and heated slowly, so that the distillation requires about half an hour, the addition of oil is not necessary; nor is the addition of alcohol necessary, although it is advantageous. Distillation with steam is too complicated. It is immaterial whether the distilling-tube reaches into the receiving

fluid or not. The temperature at which distillation proceeds rises from 90° to 120° . If the maceration is prolonged over 24 hours, the ascertained values become correspondingly lower; on the other hand, higher figures are obtained, as pointed out by Schlicht, if tartaric acid is added to the distilling material. By age mustard powder, even when preserved in hermetically sealed containers, loses a portion of volatile oil.—Pharm. Ztg., lvii (1912), No. 63, 634; from Bull. der Sciences Pharmacol, 1912, No. 7.

CISTACEÆ.

Cretan Ladanum—*Constituents*.—E. J. Emanuel reports an examination of this ancient medicament. He first traces etymology of the word through Hebrew, Arabian, Persian and Greek to the present Latin name; he then describes its source, collection and uses by the Cretans and then gives result of his analysis as follows:

1. *Resin* (48%) extracted with ether; acid numbers, direct, 169.4, indirect, 178.5; saponification numbers, cold, 187.6, hot, 193.2.

2. *Resin* (17%) extracted with alcohol from the ether-insoluble residue; acid numbers, direct, 135.1, indirect, 142.5; saponification numbers, cold, 159.9, hot, 163.8. Neither of these could be brought to solid form.

3. *Ethereal Oil* (2%) having density 0.928, b. p. 225° , refractive index 1.5118 at 13.5° .

4. *Ladaniol* (0.8%) obtained from steam distillate after removal of the oil, colorless crystals of faint aromatic odor, soluble in ether, chloroform and alcohol, m. p. 89° , having the formula $C_{17}H_{30}O$. It is therefore isomeric with champacol of Merck, but differs from same in not yielding on distillation in vacuo a sesquiterpene alcohol

5. *Resene* (15%) the white residue left in flask after steam distillation, a gray-white powder, soluble in ether, alcohol and chloroform, m. p. $125-129^{\circ}$, having the formula $C_{19}H_{26}O$.

6. *Gum* (3.5%) containing about 10 per cent. pentose and no oxydase yielding a mucic acid of m. p. 207° .

7. *Ash* (12%) consisting of silicates and phosphates (with traces of chlorides and sulphates) of iron, aluminum, calcium, magnesium and sodium.

8. *Bitter principle* (trace) giving yellow flocculent precipitate with ferric chloride and a white one with lead acetate.—Arch. d. Pharm., 250 (1912), No. 2, 111. (H. V. A.)

CARYOPHYLLACEÆ.

Lychnis Githago.—*Variation of Constituents in the Seeds During Ripening*.—M. Korsakoff finds that during the ripening of the seeds of *Lychnis githago*, the amount of substances soluble in petroleum ether undergoes a very marked diminution. Contrary to what has been observed by others in the course of ripening of the seeds, the amount of fats diminishes, instead of increasing. The quantity of sugars, both reducing and non-reducing, also diminishes. On the other hand, the amount of glucoside (saponin) increases. Only a trace of saponin is found in the young seeds, while when ripe they contain a considerable quantity. The other organs of the plant contain scarcely any saponin. Since the increase of saponin occurs simultaneously with the decrease of sugars, it may be that the glucoside is formed from the latter.—Pharm. Journ. and Pharmacist, Dec. 28, 1912, 811; from Compt. rend., 155 (1912), 1162.

CUCURBITACEÆ.

Cucurbitaceous Plants—Constituents of Some Representative Sorts.—In response to a request to contribute a paper to the Pharmaceutical Conference at Sydney, Dr. Frederick B. Power contributed a paper on a number of representative drugs derived from plants belonging to the natural order of *Cucurbitaceæ*, which had been chemically investigated during the past few years in the Wellcome Chemical Research Laboratories, London, of which Dr. Power is the Director, and which as read before the Pharmacy Section of the Australian Association for the Advancement of Science, at Sydney, N. S. W., has been extended for the present publication. Dr. Power says that the plants belonging to the family *Cucurbitaceæ* are particularly characterized by the occurrence in them of acrid or purgative principles, and it is for this reason that a considerable number have been employed to a greater or less extent as medicinal agents. It is of interest to note that a number of the drugs here considered, elaterium, pumpkin seed, watermelon seed, and bryony-root, were recorded in the inventory of a pharmacy in Frankfort-on-Main, Germany, dating from about the year 1450, and that all these, together with colocynth pulp were likewise mentioned in the *Dispensatory* of Valerius Cordus, first published in 1546, which affords evidence that these simple drugs were kept by the apothecary and used medicinally at a very remote period.

The review of the published results of chemical investigations carried out in the Wellcome Chemical Research Laboratories is in so far noteworthy because it brings the conclusions reached by Dr.

Powers and his collaborators up to date, so to speak; and though these investigations have been noted in the reports on the progress of pharmacy, the following conclusions concerning the active constituents of the cucurbitaceous drugs mentioned in the present paper may be recorded here in brevity.

Elaterium.—It has been shown that the "Elaterin" of commerce (crude elaterin), as recognized by the British and United States Pharmacopœias, and long considered a single body, is a mixture of two substances, possessing widely different properties. It was therefore evidently important that these substances should receive distinctive names, and it was proposed to designate the predominating constituent of the crude elaterin, which is lævorotatory, as " α -elaterin," and the physiologically active, dextrorotatory constituent as " β -elaterin." The latter, however, is present in very small proportions in crude elaterin, and it has not, as yet, been found practicable to obtain it in a pure state. Moreover, in an undiluted form β -elaterin would doubtless be too potent a remedy for medicinal use. It would appear possible, however, to standardize elaterin in such a manner as to secure uniformity with respect to the proportion of its physiologically active constituent, and consequent certainty of action when administered in definite doses.

Colocynth.—The results of the recent research on the constituents of colocynth have, on the one hand, afforded conclusive evidence that the so-called "colocynthin" and "colocynthitin" of previous investigators were not homogeneous, but consisted of mixtures of a very indefinite character, and that the amount of glucoside substance contained in the fruit is very small. On the other hand, it has been shown that the purgative action of colocynth is due to at least two compounds, one of which is alkaloidal, although a very weak base and apparently incapable of crystallizing or forming crystalline salts, whilst the other source of activity is represented by some principle or principles contained in both the ether and chloroform extracts of the resin. The attempts to obtain the last-mentioned active principles in a more definite state were unsuccessful.

Pumpkin Seed.—In view of results obtained, and the fact that pumpkin seed contain no principle which exhibits marked physiological activity, it could only be concluded that any value which they may possess as a tæniifuge, when administered in substance, must be attributable to a mechanical action.

Watermelon Seed.—A resin, extracted in the amount of 0.3 per cent. from the press-cake of the seed, when administered to a dog in doses of 1 gramme exhibited no physiological activity. A chemical examination of this resin led, however, to some results of interest, inasmuch as it yielded, besides a little phytosterol, a new crystalline alcohol, $C_{24}H_{40}O_4$ (m. p. 260°), which has been designated "cucurbitol."

Bryony Root.—A recent very complete examination of bryony root resulted in the isolation from the aqueous portion of extract, of: (1) a small amount of a colorless crystalline, neutral substances ($C_{20}H_{30}O_5$); (2) an amorphous, brown, very bitter, glucosidic product; (3) an amorphous, brownish-yellow, intensely bitter, alkaloidal principle; and from the portion of extract insoluble in water, a dark brown, viscid resin, from which, besides an optically inactive phytosterol, and a mixture of fatty acids, a new dehydric alcohol, "bryonol," $C_{22}H_{34}O_2(OH)_2$, melting at 210° - 212° , was isolated.

Physiological tests conducted with these products have rendered it evident that the activity of bryony root cannot be attributed to a single definite principle. Its purgative property appears to reside chiefly in resinous and alkaloidal constituents; the crystalline principle ($C_{20}H_{30}O_5$), and the glucosidal product having been found to be quite inactive when administered to dogs in doses of 0.1 gramme. The assumption of previous investigators that the active principle of bryony root is a glucoside, designated "bryonin," has thus been shown to be incorrect. The so-called "bryonin" must have consisted of complex mixtures, the constituents of which were not entirely glucosidic.—*Amer. Journ. Pharm.*, April, 1912, 145-155.

Colocynth—Satisfactory Quality of the Commercial Pulp.—J. R. Rippetoe and R. Minor have recently examined seven samples of colocynth pulp imported from the London market, and representing 1100 pounds, with results showing a percentage of seed retained by the pulp ranging from 0.14 to 1.27 per cent., only two of the samples containing over 1 per cent. A small amount of peel also contaminated the pulp, one sample, that containing the highest percentage of seed, containing 1.80 per cent., the other six quantities ranging from 0.10 to 0.58 per cent. Ash determinations were made, as also determinations of the amount of petroleum ether extract and the amount of diluted alcohol extract, in the whole apples, the pulp, the seed, and the pulp containing 3 per cent. of seed. From the data so obtained the authors reach the following conclusions:

1. Commercially the pulp cannot be entirely freed from seeds, but it can be obtained containing less than 2 per cent. of seeds. The pulp may also contain pieces of the rind.

2. The presence of seed and rind in the powdered pulp can readily be detected (with the microscope) by the presence of aleurone grains and their respective characteristic stone cells.

3. The seeds contain not more than 2.0 to 2.5 per cent. of ash, while the pulp contains from 9.00 to almost 14.00 per cent., which should be soluble in dilute HCl.

4. In view of these and other conclusions, the authors suggest that the ninth revision of the U. S. P. require that colocynth (pulp ? Rep.) should not yield more than 1.5 per cent. of petroleum ether extract and contain not less than 9.00 per cent. of ash soluble in dilute HCl. These requirements should apply more to the powder than to the pulp in pieces. They further suggest that "Colocynth" be defined as "the pulp of the peeled dried fruit."—Amer. Journ. Pharm., May, 1912, 196-200.

MYRTACEÆ.

Bay Trees—Experimental Culture at Montserrat.—The cultivation of the bay tree (*Pimenta acris*, Kostel) has been attended with a fair measure of success at Montserrat. In 1908, 850 year-old seedlings per acres were planted at distances of six feet, in rows of nine feet apart, cotton being planted between the rows. The first crop of leaves was gathered in June, 1911, when the shrubs were six feet high, the leaves yielding about 1 per cent. of oil. Each year the leaves per acre has shown an increase—in 1905 it was 2660 lbs., and in 1910 it was 8814 lbs.—Schimmel's Rep., Oct., 1912, 25; from Rep. Bot. Station, Montserrat 190, 1911, p. 16, through Bull. Imp. Inst., 1912, 147.

Chimonanthus Fragrans and Allied Plants—Presence of Cyanogenetic Constituents.—M. Mirande finds that the popular winter-flowering garden shrub, *Chimonanthus fragrans*, and the nearly allied *Calycanthus floridus*, *C. lævigata*, and *C. occidentalis*, yield hydrocyanic acid when macerated with water and distilled. The fresh leaves of *Chimonanthus fragrans* yielded 0.019 per cent, *Calycanthus occidentalis* 0.016 per cent., and each of the other *Calycanthus species* yielded 0.04 per cent. of hydrocyanic acid, which does not exist free but is liberated by the action of an enzyme, probably from a cyanogenetic glucocide.—Pharm. Journ. and Pharmacist, Nov. 9, 1912, 581; from Compt. rend., 155 (1912), 783.

Cloves—Allowable Proportion of Stems.—According to the Swiss Food Book the proportion of stems in cloves must not exceed 5 per cent., whereas in Germany a maximum of 10 per cent. of stems is permitted. Dr. A. Berson, as the result of a series of examinations, finds the Swiss requirement to be too stringent, such a product being difficult to secure in commerce, apart of other inconveniences, among which the difficulty of obtaining an average sample. Although not advocating the presence of as large a proportion as 10 per cent. of stems, he believes that the requirement of the Swiss food law should permit a maximum of 8 per cent.—Pharm. Ztg., lvii (1912), No. 48, 482; from Chem. Ztg., 1912, No. 64.

Amani Cloves—Yield and Properties of Volatile Oil.—Schimmel & Co. has received a sample of the first crop of cloves from Amani, German East Africa, which yielded 16.6 per cent. of volatile oil possessing normal properties, as follows: Sp. gr. at 15°, 1.0558; opt. rot., $-1^{\circ}4'$; refract. index, 120°, 1.53204; phenol content, 92 per cent.; soluble in 1.2 vols. and more of 70 per cent. alcohol.

A sample consignment of clove stems from the same place yielded only 5.3 per cent. of oil, which, however, was equal in quality to the other commercial varieties: Sp. gr. at 15°, 1.0515; opt. rot., $0^{\circ}58'$; refr. index, 20°, 1.53461; soluble in 1.1 vol. and more of 70 per cent. alcohol. The quantity of oil distilled was too small to estimate its eugenol content.—Schimmel's Rep., April, 1912, 57.

Seychelles Cloves—Properties of Volatile Oil.—Schimmel & Co. have had occasion heretofore to describe the oil obtained from Seychelles clove leaves. They have recently received several samples of Seychelles cloves, which they have worked up for oil. Two of these distillations gave the following constants: Sp. gr. at 15°, 1.0470 and 1.0485; opt. rot., $1^{\circ}30'$ and $1^{\circ}6'$; phenol content, 85 and 86 per cent., respectively. Both oils were soluble in 1.5 vols. of 70 per cent. alcohol, but upon the addition of 4 vols. of the solvent the mixture turned cloudy. In this respect these oils behaved similar to an oil distilled (in 1904) from Amboina cloves, which, although normal in other respects, also gave a clear solution at first in 70 per cent. alcohol, but solutions of pronounced turbidity with 3 to 4 vols.—Schimmel's Rep., April, 1912, 57.

Australian Eucalypts—Yield and Character of New Oils.—R. T. Baker and H. G. Smith have described a number of new eucalyptus oils, distilled by them from the leaves of different Australian eucalypts:

Eucalyptus acaciiformis, Drane et Maiden, known as "red" or "narrow leaved peppermint," yielded 0.197 per cent. of a brown oil, having a turpentine-like odor, and consisting principally of *d*-pinene.

Eucalyptus Andrewsii, J. H. Maiden, yielded 1.27 per cent. of a lemon-yellow oil, consisting principally of *l*-phellandrene, and containing scarcely a trace of cineol.

Eucalyptus campanulata, Baker et Smith, yielded 0.851 per cent. of a pale yellow oil, containing phellandrene as principal constituent, with some cineol, piperitone, and endesmol.

Eucalyptus Bridgesiana yielded 0.73 to 0.745 per cent. of oil, containing from 73 to 78 per cent. of cineol.

Eucalyptus laevopinea yielded an oil which did not contain above 5 per cent. of cineol.

Eucalyptus dextropinea yielded 1.02 per cent. of crude oil, which on rectification became nearly colorless. The crude oil contains 3.7 per cent. of geranyl acetate.

Eucalyptus nova-angelica yielded an oil containing a sesquiterpene in considerable proportions, with a very small cineol content, and occasionally small quantities of phellandrene.

Parts 4 and 5 of the second volume of the work, "A Critical Revision of the Genus *Eucalyptus*," edited by J. H. Maiden, has also appeared, and a number of species are mentioned by title in the abstract from which the preceding is quoted in Schimmel's Rep., Oct., 1912, 63-64; from Journ. and Proc. Royal Soc. of N. S. W., 45, 267.

Jambul Seeds—Chemical Examination.—Frederick B. Power and Thomas Callan have made a chemical examination of the so-called Jambul seeds—the seeds of *Eugenia Jambolana*, Lam. (*Syzygium Jambolanum*, D. C.)—and, after a description of their experiments in detail, summarize their results and conclusions, as follows:

A preliminary examination of the seed showed them to contain neither an alkaloid nor an enzyme, but an abundance of starch and tannin.

An alcoholic extract of the seed, when distilled in a current of steam, yielded a small amount of a pale yellow essential oil, which possessed the following constants:

$d_{20^{\circ}/20^{\circ}} = 0.9258$; $n_D - 2^{\circ}51'$ in a 50 Mm. tube.

The portion of the alcoholic extract which was soluble in water contained considerable amounts of tannic and gallic acids, together with a sugar, which yielded *d*-phenylglucosazone (m. p. 207°), and

a small amount of a phenolic substance, which was obtained in a much larger quantity from the resin, as noted below.

The portion of the alcoholic extract which was insoluble in water consisted of a soft resin, amounting to about 2.4 per cent. of the weight of the seed. From this material, by its successive extraction with various solvents, the following products were obtained: A mixture of fatty acids, consisting of palmitic, stearic, oleic, and linolic acids; a very small amount of a solid (m. p. 78-80°), which, apparently, was a mixture of an alcohol and hydrocarbon; and a trace of a phytosterol. The most interesting constituent of the resin, however, is a new phenolic substance possessing the empirical formula $C_{16}H_8O_9$, which has been designated *Jambulol*. This substance is a light-brown powder, which is insoluble, or nearly so, in the usual organic solvents, but separates from its solution in pyridine in brown needles containing solvent of crystallization. The following crystalline derivatives of the substance have been prepared: *Penta-acetyljambulol*, $C_{16}H_8O_9(CO.CH_3)_5$, which forms pale brown leaflets, melting and decomposing at about 335°, and *pentabenzoyljambulol*, $C_{16}H_8O_9(CO.C_6H_5)_5$, which was obtained in small, colorless plates, melting, without decomposition, at 333°.

The statement of Pottiez (Ann. de Pharm., 1899, 5, 491-493) that Jambul seeds contain quercitol and cinnamic acid could not be confirmed, for there was no evidence of the presence of either of these substances in the seeds which have now been examined.

With regard to the very indefinite product which was brought to notice some years ago by Boersch under the name of "Antimellin" (Apoth Zeit., 1899, p. 510), and was said to be a glucoside, it need only be stated that no substance of a glucoside nature could be found by us in Jambul seeds.—Pharm. Journ. and Pharmacist, March 30, 1912, 414-417.

ROSACEÆ.

Cherry Laurel—Occurrence and Function of Free Prussic Acid in the Plant.—Attention is drawn by Peche to the well-known fact that considerable quantities of free prussic acid are accumulated in the living tissues of certain plants, and that this poisonous acid is without doubt used as a food material for these plants. The author concludes from his observations that the acid found in the leaves and organs of the cherry laurel is produced as a direct result of carbon-assimilation in the green leaf-cells when exposed to light, and that it is not merely a product of the hydrolysis of glucosides. He has found evidence that while part of the prussic acid enters

into the building up of glucosides, some of it is transported in a labile form, probably in loose combination with tannin, and is stored up in various tissues as reserve food.—Pharm. Journ. and Pharmacist, Aug. 17, 1912, 233; from Sitzungsber. Kais. Akad., Vienna, 1912, through Nature, July 25, 1912, 539.

Prunus Mississippensis—*Proposed Use of the Leaves for Making Cherry-Laurel Water*.—L. Musso observes that, since *Prunus Mississippensis* grows much more freely when introduced in Algeria than *Prunus lauro-cerasus*, it has been suggested that the leaves might be used as a substitute for the official cherry laurel leaves for preparing cherry-laurel water locally. The author finds, however, that the leaves of the American cherry-laurel are not so rich in active principles; hence, to obtain the requisite amount of hydrocyanic acid in the product, a smaller amount of distillate would have to be collected. Incidentally, during his experiments, it was found that to obtain the best results the material should be as fresh as possible; the crushing of the leaves should be carefully performed, and it is advantageous that the upper portion of the worm-condenser be slightly ascending or vertically inclined.—Pharm. Journ. and Pharmacist, Nov. 2, 1912, 553; from Journ. de Pharm. et Chim., 1912, 6, 301.

Photinia Serrulata—*Cyanogetic Glucoside a Constituent*.—Hêrissey has extracted from *Photinia serrulata* (Rosaceæ) a crystalline cyanogenetic glucoside. The substance is isomeric with prulaurasin, and yields phenyl-glycollic acid when treated with cold concentrated hydrochloric acid. These facts suggest that the body is amygdonitrile glucoside, and this has been confirmed by a determination of the rotatory power and of the reducing sugar produced on hydrolysis with emulsin.—Pharm. Journ. and Pharmacist, July 6, 1912, 7; from Rep. de Pharm., 1912, 6, 283.

LEGUMINOSÆ.

Acacia—*Production in the German African Possessions*.—According to Dr. Adlung, acacia is collected in a number of the German African possessions, not only in East Africa, but also in Southwest Africa and the Cameroon. The product from the Cameroon, which is collected exclusively by the natives, is presumptively derived from *Acacia Senegal*, and has acquired considerable commercial importance, but should not be accepted unconditionally as being derived from that source or being of unexceptionable quality.—Pharm. Ztg. lvii (1912), No. 31, 310; from Gehe's Report, 1912.

Balsam of Myroxylon Punctatum—A New Product.—In "Riedels Berichte," 1912, a new balsam, obtained from *Myroxylon punctatum*, Klotzsch, is described as occurring in form of a dark brown mass, of thick extract-like consistence, permitting it to be drawn out into strands, but drying on exposure to the air to a soft, pulverizable resin. The balsam has an agreeably aromatic odor, reminding of tonka beans. When heated with permanganate no odor of benzaldehyde was developed, proving the absence of cinnamoin. Water heated with the balsam acquires milkiness and an acid reaction, the mixture turning yellow on addition of ammonia and clearing up somewhat. It produces a yellow-brown turbid solution with solution of sodium hydroxide, is completely soluble in warm absolute alcohol, becoming, however, turbid on cooling, and forms turbid solutions with 90 per cent. alcohol in all proportions; while the other organic solvents—ether, benzene, carbon-disulphide, chloroform, etc.—appear to dissolve this balsam very sparingly, acquiring only a faint yellow color when triturated with it. On the other hand, warm acetic acid dissolves the balsam completely, the solution remaining clear on cooling. The saponification number, determined in alcoholic solution, was 184.8, and the neutral ester-like compounds amounted to 10.1 per cent.—Pharm. Ztg., lvii (1912), No. 30, 303.

Balsam of Peru—Production.—An apparently authentic account of the production of Balsam of Peru is given in the "Journal of the Royal Society of Arts," January 12, 1912, according to which this balsam is not produced in Peru at all, but on a comparatively small strip extending for a distance of about forty miles and a depth of perhaps fifteen miles along the coast-line of Salvador. The misnomer "Balsam of Peru" is due to the fact that coming from the west coast it has for 300 years or more been shipped across the Isthmus of Panama, these shipments being confused with those from Peru. Although the tree, one of the most beautiful of a tropical forest, holds sap at all seasons of the year, yet it becomes more abundant according as the season is dry, hence the summer is selected as the most favorable time for collecting the crop. When the dry season is assured the gatherer selects his tree and gets it ready at the period of the young moon. Omitting some of the details, the procedure may then be described in brevity as follows: The tree is girdled in a peculiar fashion by striking or scratching the bark with a blunt implement so as to expose the second (inner) layer, from which, after five to eight days the mature sap flows and continues to do so for about eight days more. This tender portion

is covered with a very clean cloth to absorb the sap. A second irritation must then be effected. This is done by the application of heat with a burning torch and much depends upon the care and skill to get the right effect. In this way heat is applied every two months, about six changes of clean cloths being made during each interval. The sap collected in this way is then removed from the cloths by placing them at once in a kettle of water and boiling them for half an hour. The pieces are then immediately, while quite hot, expressed in a primitive press and as the cloths are squeezed the sap exudes and settles to the bottom of the kettle placed beneath. The liquor on top is poured off and crude balsam remains; this is put into a vat beneath which a slow fire is kept burning, whereby the water is driven off and the organic impurities rise to the surface. The balsam so clarified is then poured into the rectangular tins (55 lbs.) in which it finds its way to the European and American market. Methods of adulteration are sometimes practiced and are described as carried out during the preparation. The life of a tree is about 100 years; the gathering begins at the age of 25 years, and the sap may be gathered during its entire life, unless some accident occurs to the tree meanwhile.—Pharm. Journ. and Pharmacist, Jan. 27, 1912, 95.

Balsam of Peru—G. P. V. Method of Examination.—Dr. G. Fromme, referring to the frequent and skillful sophistication of balsam of Peru, makes some critical remarks on the G. P. V method of its examination. The official test for the presence of fixed oils directs the use of concentrated solution of chloral hydrate; but he finds that sufficiently accurate results are obtained with dry chloral hydrate. Regarding the test for cinnamein, which consists in shaking out a mixture of 2.5 balsam, 5.0 water, and 5.0 soda solution, with 50 Cc. of ether, evaporating 25 Cc. of the ethereal solution, and weighing the residue, he agrees with the recent criticism of F. Lehmann and A. Müller, that this allignot part does not accurately represent 1.25 of the balsam. Contrary to the strictures of Lehmann and Müller, however, that the addition of 3.0 tragacanth for the complete separation of the alkaline from the ethereal portion, as proposed by the author, is irrational, he maintains that this addition results in the rapid and complete separation of the two liquids.—Pharm. Ztg., lvii (1912), No. 84, 845; from Cæsar & Loretz's Ann. Rep., 1912.

Balsam of Peru—Improved Method of Examination.—T. Delphin recommends the following improved method for the examination of balsam of Peru: About 2 Gm. of the balsam are dissolved in

a flask in an equal volume of ether and 20 Cc. more of ether are then added. The solution is filtered into a separating funnel and the flask and filter are washed with ether until a few drops of the filtrate leave no residue on evaporation. To the united filtrate and washings 40 Cc. of $\frac{1}{2}$ N. KOH are added and the mixture is decomposed by careful shaking. The lower portion of the liquid in the separator is then run off and the residual ether-solution washed several times by shaking out with portions of 2 Cc. of water. On then evaporating the ether-solution, the total cinnamein is obtained in a pure condition and in reliably quantitative proportions. The neutralized residual liquid remaining after the cinnamein determination is then heated on a water bath to drive off any alcohol, transferred to a separator with the rinsings of a little water, and shaken out twice with ether. It is then diluted with water to 25 Cc. and a few drops of calcium chloride solution are added. If the balsam is pure, only faint opalescence is produced, but if it contains fixed oil this is revealed by the copious precipitate formed.—Pharm. Ztg., lvii (1912), No. 20, 198; from Svensk. Farm. Tidskrift, No. 3, 1912.

Balsam of Peru—Assay of Cinnamein.—Lehmann and Müller publish a critique of this assay as given in the last German Pharmacopœia, calling attention to the faulty use of aliquot parts without correction factors and to the fact that the method of shaking the alkaline solution of the balsam does not extract all of the cinnamein. They therefore suggest a modified method of assay which can be condensed as follows: 2.5 g. balsam is mixed with 5 Gm. water in 75 Gm. prescription bottle, exactly 30 Gm. ether is added, bottle corked and mixture shaken for one minute. Then add 5 Gm. solution of sodium hydroxide, shake for one minute, let stand ten minutes, invert bottle, loosen cork enough to let about 3 Cc. of the watery layer drop out. Then add 0.5 Gm. tragacanth, shake vigorously and after three to five minutes pour off 25 to 28 Gm. of the ether layer into tared wide-mouthed flask. Ascertain exact weight of the ether solution, then drive off the ether on water bath, dry residue at 100° C. from one-half to three-quarters of an hour and then weigh. The calculation is as follows: If 25.6 Gm. ether solution yields 1.22 Gm. dry cinnamein, then it means 24.38 Gms. ether (25.6—1.22) has extracted 1.22 Gm. cinnamein and the entire 30 Gm. ether used has extracted $30/24.38 \times 1.22$ or 1.5 Gm. cinnamein. Then calculate percentage in regular way.—Arch. d. Pharm., 250 (1912), No. 1, 1. (H. V. A.)

Calabar Beans—Alkaloidal Assay.—During a chemical examination of calabar beans it was noticed that the amount of total alkaloid determined according to the method of the U. S. P., was considerably less than the amount obtained when working on a larger scale. A series of experiments were therefore made by Arthur Henry Salway, of the Wellcome Chemical Research Laboratories, in order to determine the cause of this discrepancy, the results of his experiments, which are described in some detail, leading him to recommend the following modification of the official assay process as reliable:

Twenty grammes of powdered calabar beans (No. 60 powder) are agitated with 200 Cc. of ether, then 10 Cc. of an aqueous solution of sodium carbonate (1:10) added, and the mixture shaken vigorously at intervals of four hours. The powder is allowed to settle, after which 100 Cc. of the ethereal liquid are transferred to a separator, and sufficient decinormal sulphuric acid added to render it distinctly acid. The liquid is then well shaken and the acid layer drawn off, this operation being repeated twice, using each time 10 Cc. of decinormal sulphuric acid. The acid extracts are then combined, sufficient sodium carbonate solution (1:10) added to render the liquid alkaline, and the mixture subsequently shaken ten times successively with 20 Cc. of ether. The combined ethereal extracts are next washed with 5 Cc. of distilled water and the ether removed. The residue is finally dissolved in 5 Cc. of decinormal sulphuric acid, and the excess of acid titrated with N/50 alkali, using iodeosin as indicator.—*Amer. Journ. Pharm.*, Feb., 1912, 49-51.

Copaiba—Methods of Adulteration.—Dr. G. Fromme observes that, although the tests of the G. P. V have materially increased the difficulty to adulterate the copaiba, his examination of numerous specimens offered on the market point out that the business of the adulterator flourishes as merrily as ever. The most common adulterant is the well known "African balsam," which, containing twice as much volatile oil soluble in alcohol as copaiba, serves the purpose of sophistication admirably. The somewhat lax and foreign odor is corrected by the addition of some other volatile oil (such as oil of cedar) and the consistence is improved by the addition of colophonium, or some other resin. Such sophisticated copaiba will frequently pass muster when subjected to the official tests, failing only in that of polarization, since the volatile oil of copaiba is levorotatory, whereas African balsam oil deflects to the right.—*Pharm. Ztg.*, lvii (1912), No. 84, 845; from Cæsar & Loretz's Annual Rep., 1912.

Copaiba—Distinction from African Copaiba by the Rotatory Characters of the Volatile Oil.—In a paper by T. T. Cocking (see Proceedings, 1911, 246) it is stated that the optical rotation of the volatile oil from genuine samples of copaiba is invariably higher than that of the first 10 per cent. distilled from the oil, and this suggested feature of copaiba is recommended as a test for its identification and distinction from African copaiba in the next edition of the B. P. Ernest J. Parry, however, questions its reliability, and protests against the inclusion of this test, at all events until its reliability has been confirmed by a good deal of other work; for it is necessary, from his own experience, that a large number of samples of oils distilled from various copaibas by means of steam should be carefully examined by the proposed method. He has recently examined several consignments of Maracaibo copaiba, imported direct from South America, and of unquestionably reliable source, which were quite normal in character. Yet in no case did the rule hold true that the optical rotation of the oil was higher than that of the first 10 per cent. fraction of the same in a series of ten fractions obtained by distillation under very reduced pressure. Quite to the contrary, the first fraction was usually higher in rotatory power than any of the subsequent fractions, some of the latter being even considerably lower—though that of the final (10th) fraction was usually somewhat higher than that of the first.—Chem. & Drugg., Jan. 6, 1912, 19.

In a rejoinder to Mr. Parry's stricture, Mr. Cocking, after pointing out some of the possibilities of experimental error, mentions that in his experience all genuine copaibas yield volatile oils which in every case have a higher rotatory power than the first 10 per cent. distilled *in vacuo* from them.—Ibid, Jan. 27, 1912, 128.

Copaiba—Estimation of β -Caryophyllene as a Test for Adulteration.—By acting on β -caryophyllene with nitrogen tetroxide (NO_2), a crystalline nitro-derivation of caryophyllene, $\text{C}_{12}\text{H}_{19}\text{N}_3\text{O}_6$, melting at 159.5° - 160° , is obtained. This compound is found very useful for the detection and estimation of β -caryophyllene in volatile oils, by Deussen and Eger, who have applied it to the examination of the following oils: (1) Caryophyllene from clove oil; (2) Para copaiba oil; (3) Maracaibo copaiba oil, and (4) mixtures of Para copaiba oil with gurjun oil and African copaiba oil. Three grams of the oil is dissolved in 25 Cc. of absolute ether and treated with the nitrogen oxide. As soon as the separated nitro-compound begins to agglomerate at the bottom of the vessel, the reaction is stopped, and the precipitate filtered off, washed with ether, dried

on a porous tile, and weighed. The direction in which this reaction may eventually be of considerable value is shown by the following figures, giving the amount of crystalline nitro-compound obtained:

Oil	Nitro-Compound
1 Caryophyllene (from stem oil).....	yielded 50-52%
2 Caryophyllene (from bud oil).....	" 50 %
3 Para copaiba oil (rotation—11.75°).....	" 9.5-10%
4 Para copaiba oil (rotation—14.5 °).....	" 15 %
5 Para copaiba oil (rotation—10.25°).....	" 15 %
6 Para copaiba oil (rotation—19.40°).....	" 15-16%
7 Maracaibo copaiba oil (rotation—3.9°).....	" 5- 6%
8 Maracaibo copaiba oil (rotation—10.20°).....	" 3 %
9 Maturin copaiba oil (rotation—10.30°).....	" 8- 9%
10 No. 6 with 10% gurjun.....	" 13.3-14.3%
11 No. 6 with 20% gurjun.....	" 11.7-12.7%
12 No. 6 with 30% gurjun.....	" 10.7-11.7%
13 No. 6 with 50% gurjun.....	" 7.7- 8.7%

The authors recommend Turner's reaction for the detection of gurjun balsam in copaiba. This consists in dissolving 3 drops of the sample in 3 Cc. of acetic acid with 2 drops of a freshly prepared 10 per cent. solution of sodium nitrite, then pouring the liquid onto a layer of concentrated sulphuric acid. Within half an hour a deep violet color develops in the acetic-acid solution if gurjun balsam be present.

The authors also recommend and describe a reliable method for the detection of African copaiba, which is based on the difference in the melting points of the dihydrochloride of β -caryophyllene (60°-70°) and of the dihydrochloride of cadinene (117°-118°), produced by the action of gaseous HCl on the solution of the oil in absolute ether. In pure Para copaiba oil, the first mentioned is principally present, whereas in African copaiba oil cadiene dihydrochloride largely predominates.—Chem. and Drugg., May 25, 1912, 779; from Chem Ztg., 1912, 561.

Erythrophlæum Guineense—*Chemical Examination of the Bark*.—In 1876 Gallois and Hardy made a chemical examination of the bark of *Erythrophlæum Guineense*, G. Don (see Proceedings, 1877, 217), commonly known as "sassy bark," which was brought to notice on account of its intensely poisonous properties, by reason of which it has long been employed by the natives of Western Africa as an ordeal poison in their trials for witchcraft and sorcery, as well as for other criminal purposes. This bark also apparently enters into the composition of the arrow poison of the "Pigmies,"

and is known by a number of other common names, such as "man-cona bark," "red-water tree bark," "casca bark," "doom bark," and in the vernacular of the Congo as "Nkasa." Gallois and Hardy isolated from this bark a very toxic alkaloid, which they named "erythrophleine," and describe as a transparent amorphous solid, yielding, however, crystalline hydrochloride. In 1882, Harnack and Zabrocki made a pharmacological investigation of "erythrophlœine," the product of a German manufacturer, and in 1896 Harnack again undertook the examination of material which had been obtained from the same manufacturer (see Proceedings, 1897, 722), which, however in distinction from the material previously examined, produced only a digitalin-like effect, and not also that of picrotoxin. Moreover, contrary to the statement of Gallois and Hardy, the hydrochloride of the base showed no tendency to crystallize.

It would seem probable that the varying results obtained by these investigators may be attributed, as Harnack and others have suggested, to the use of barks from different species of *Erythrophloeum*, or possibly from varieties of the same species; and, having been supplied by Mr. Iner C. Wickware, of the Christian Missionary Alliance, at Boma, with material designated by him as "Nkasa Bark," the identity of which with "Sassy Bark" (from *Erythrophloeum Guineense*, G. Don) was confirmed by Mr. E. M. Holmes, Dr. Frederick Power and Arthur H. Salway, of the Wellcome Chemical Research Laboratories, London, have made a complete examination of this bark (of undoubted origin, as shown in a photograph of a felled tree from which the so-called "Sassy Bark," or "Nkasa" had been collected for many years, and from which the present supply was also collected). The results of their very comprehensive investigation are summarized by the authors as follows:

A quantity of the bark was completely extracted with hot alcohol, and the resulting concentrated extract distilled in a current of steam, but it yielded no essential oil.

From the portion of the extract which was soluble in water the following substances were isolated: A very small amount of "lutcolin," $C_{15}H_{16}O_6$, and a small amount of an alkaloid which agreed in its characters and physiological action with "erythrophleine," as described by Harnack. Neither the alkaloid nor its salts could be obtained in a crystalline state, and they were therefore not considered suitable for analysis. The aqueous liquid contained, furthermore, besides some indefinite amorphous material, a con-

siderable quantity of *tannin*, and a *sugar* which yielded *d*-phenyl-glucosazone, melting at 210° .

The portion of the alcoholic extract which was insoluble in water consisted of a dark brown, brittle resin, and represented 13.5 per cent, of the weight of the bark. From this product the following substances were obtained: A "*phytosterol*," $C_{27}H_{46}O$ (m. p. 130° - 133°); cerotic, stearic, palmitic, oleic, and linoleic acids; and very small quantities of "*ipuranol*," $C_{23}H_{38}O_2$ (OH_2), and "*luteolin*." A portion of the latter compound was apparently contained in the resin in the form of a glucoside.

Inasmuch as the results of a preliminary test had indicated a much larger proportion of alkaloid to be contained in the bark than could subsequently be isolated, it appears probable that some change had taken place during the process of extraction. This could not be more precisely determined on account of the very indefinite character of the base, which also precluded its further chemical study.

Since the bark under consideration is an exceedingly violent poison, and is largely used in West Africa for criminal purposes, it may be finally noted that the recognized and apparently most efficient antidote consists in the prompt administration of an emetic, or use of the stomach pump, with subsequent stimulant remedies.—*Amer. Jour. Pharm.*, Aug., 1912, 337-351.

Licorice Root and Licorice Extract—Constituents.—In an elaborate paper on the constituents of licorice root and of licorice extract, designated as "Part I," Percy A. Houseman says that the most valuable contributions to our knowledge of licorice have been made by Tschirch and his co-workers. Other recent authors have made, for the most part, only unimportant modifications of methods of analysis proposed by the earlier investigators—Diehl, Habermann, Py, Hafner and others. The earlier methods of analysis for licorice extract are largely embodied in that published by Parry (see *Proceedings*, 1910, 80-82), and this method, reproduced by Parry, had for more than twenty years previously been found as satisfactory for commercial use as any other, but is capable of much improvement, chiefly in two directions:

1. The determination of the *true* glycyrrhizin instead of the so-called "crude" glycyrrhizin, which possesses various and unknown degrees of crudeness.

2. The inclusion in the analysis of some of the undesirable constituents of licorice extract, notably of bitter substances and of

resins, thereby lessening the item of "extractive and coloring matter," which is at present used to make the analytical figures add up to 100.

The author then gives a summary of the method of analysis used by him, then proceeds to discuss the recent papers of Tschirch, Erickson and others, and in a number of tables gives the results obtained under conditions discussed, and accordingly modified, with a number of identical licorice roots from a variety of sources—Russian, Syrian, Anatolian, Turkish-Arabian, Italian, Spanish-Alicante, Spanish-Cordoba, Spanish-Zaragossa, Spanish-Seville, and Spanish-Toledo. The details must be consulted in the original. It must suffice to here reproduce the author's

SUMMARY.

1. A method of analysis for licorice mass is given, with comments thereon, and remarks on other methods proposed.

2. The constituents of licorice root, which were obtained by various solvents, have been quantitatively compared in ten different roots, and results given for resins, bitter principles, glycyrrhizin and sugars. The resins were shown to be confined to the bark of the root, and with mild extraction with hot water, they remain mostly in the exhausted root.

3. It was found that nearly one-third of the most important constituent of the root—the glycyrrhizin—is not accounted for when the root is extracted with hot water, and is presumably decomposed.

The author reserves for a future communication a description of the physical and chemical properties of the substances obtained in this investigation. He also intends to transfer the knowledge gained of the constituents of the root, to improve the analysis of the extract, so as to include some of the undesirable constituents thereof.—*Amer. Journ. Pharm.*, Dec., 1912, 531-546.

Minjak Lagam.—This is an oleoresin resembling copaiba, coming from the west side of Sumatra and has been recently studied by van Itallie and Kerbosch. They find it a thin fluid smelling like copaiba with also a suggestion of butyric acid, orange yellow with green fluorescence, having a density of 0.9512 at 15°. When heated to 90°, it thickens and gelatinizes on cooling, due possibly to polymerization. It has acid number 10.45 and saponification number 14.8 and calculated by loss on evaporation, contains 60.9 per cent. volatile oil. This oil, when obtained by distillation with steam, has a density of 0.9051 at 15°, a refractive index of 1.4972

at 24° and a rotation of 7.5° in a 100 Mm. tube. Analysis showed that the oil consists largely of caryophyllene. The resin left after driving off the oil is brittle and bright yellow.

While previous investigators thought the oleoresin came from *Canarium eupteron*, microscopic examination of the wood particles in the resin, led the authors to the belief that it originated in a species of *Dipterocarpus* and careful investigation by Valeton and Smith established the fact that it came from either *Dipterocarpus Hasseltii* or from *D. trinervis*. A thicker form or Minjak Lagam was also examined with results similar to the other sample, except that the percentage of oil (consisting chiefly of caryophyllene) was only about 28 per cent. Only 66 per cent. of the oleoresin dissolves in petroleum ether and from the insoluble part by recrystallization was obtained a physosterol (19% of oleoresin used) which, since different from the known physosterols has been named *diptero-carpol*. This occurs in colorless strongly polarizing crystals, m. p. $134-135^{\circ}$ insoluble in water and in alkalies, soluble in boiling alcohol, chloroform, ether and acetic ether. It gives characteristic cholesterol reactions and its combustion and molecular weight figures show the composition $C_{27}H_{46}O_2$.

On treatment with acetic anhydride and with phenylisocyanate, it splits off one molecule of water forming the anhydride $C_{27}H_{44}O$ while oxidation with chromic acid mixture, yields a ketone diptero-carpone $C_{27}H_{43}O_3$ melting at $183-184^{\circ}$ from which an oxime (m. p. $249-250^{\circ}$) was prepared.—Arch. d. Pharm., 250 (1912), No. 3, 199. (H. V. A.)

Senna—Preexistence of Calcium Oxalate in the Leaves and Formation of Calcium Tartrate in the Infusion.—In an interesting paper including both microscopical and microchemical observations, elaborately illustrated and described, T. E. Wallis has demonstrated that while senna leaves contain calcium oxalate crystals, they do not contain any crystals that can be identified under the microscope as calcium tartrate, but that the deposit which is invariably formed from fresh hot infusions of senna leaves on standing a few days consists of calcium tartrate; moreover, calcium tartrate crystals are also formed by macerating senna leaves in cold water on standing a few days, thus making it evident that the deposit cannot result from difference in solubility of calcium tartrate in hot and in cold water. His experiments show that the calcium tartrate does not exist as such in the leaves, but seems to be produced by some action in the infusion after it has been made, between bodies extracted by the water from the leaf. Those leaves which give no deposit

of calcium tartrate show a deficiency of soluble tartrate, although containing an abundance of soluble calcium salts. It is further shown that neither excess or deficiency of oxygen has any effect upon the quantity deposited or rate of deposition in those infusions which do deposit crystals of calcium tartrate. Senna pods, show a deficiency in soluble tartrate, and an abundance of soluble calcium salts, and yield infusions which do not deposit calcium tartrate. The best micro-chemical reagent to distinguish calcium tartrate from calcium oxalate is a solution of sodium hydroxide, which rapidly dissolves the tartrate, but has no immediate action upon calcium oxalate.—Pharm. Journ. and Pharmacist, Nov. 23, 1912, 644-647.

Psoralea Coryifolia—*Chemical Examination of the Seeds*.—Ernest W. Mann and R. E. Griffiths report the results of a chemical examination of the seeds of *Psoralea corylifolia*, a plant growing as a common herbaceous weed over a great part of India, where the seeds have found some medicinal use. By steam distillation and extraction of the distillate with ether and petroleum spirit, about 0.2 per cent. of an oil and crystalline substance was obtained, having a marked heavy aromatic odor, the aqueous portion of the distillate giving a slight reaction for aldehyde by Schiff's test. By direct extraction of the powder 13.7 per cent. of a thick brownish oil was obtained. By extraction with alcohol 37.2 per cent. of a brown, thick extract was obtained, which, after extraction and washing with petroleum spirit, resolution in alcohol, and precipitation by pouring in water, yielded a resinoid amounting to 9.2 per cent. of the seeds. This resinoid was practically entirely soluble in ether, chloroform, and in ethyl acetate; but by treatment with ethyl acetate it was possible to divide it into two portions—the one insoluble, the other of an acid nature passing into solution. An inconsiderable trace only of alkaloidal matter was obtained from the seeds by direct extraction with Prollius' fluid.—Pharm. Journ. and Pharmacist, Feb. 24, 1912, 260.

Quino-Quino Balsam.—Hartwich and Jama (Schweiz. Wschr. f. Chem. u. Pharm., 1909, Nos. 41 and 42), described this Bolivian balsam derived from *Myroxylon balsamum* var. *punctatum*, while Riedel (Mentor, 1912, 33), describes a balsam supplied from the same plant, having distinctly different properties. Hartwich now discusses these differences and decides that while both were from the same tree, his was the exudation from the trunk while Riedel's was from the fruit.—Schweiz. Wschr. f. Chem. u. Pharm., 1 (1912), No. 21, 312. (H. V. A.)

Tragacanth—Sophistication with the so-called "Indian Gum."—Calling attention to the substitution and adulteration of powdered tragacanth with a substance known to the trade as "Indian Gum," which has been practiced for several years, beginning about 1904-1905, and has assumed large proportion, H. C. Fuller, of the Institute of Research, Washington, D. C., observes that there are several gums known as "Indian gum," none of which are obtained from any species of *Astragalus*, and that while it is possible the Indian gum used so extensively for the purpose named may vary as to its origin, it is stated on trustworthy authority that the gum in question is derived from *Sterculia urens*. The gum from this plant, moreover, is used as a substitute for tragacanth in the government hospitals in Bombay. This substitute gum in the whole condition has none of the physical characteristics of tragacanth. It occurs in striated irregular lumps, sometimes twisted, transparent or translucent and not in ribbony bands like tragacanth, and often contains considerable bark, which is bolted out before the powdered material is ready for the market. The powder is usually very white, but retains some of the characteristic stone cells of the bark, which serve as a means of identifying the source of the product. If this product is a straight substitution there is little difficulty to distinguish it from pure tragacanth, by the character of its solution, its acidity, the absence of starch-reaction, etc.; but in the case of a mixture of the gum with tragacanth, the examination becomes more complicated. One of the most serviceable tests is that recommended by Scoville (see Proceedings, 1909, 217), which depends on its peculiar reaction with borax.—Amer. Journ. Pharm., April, 1912, 155-158.

Gum Tragacanth—Comparison of its "Volatile Acidity" with that of Indian Gum.—With the primary object of devising additional methods for the detection of Indian gum (*Sterculia urens*) when substituted for or in admixture with tragacanth, W. O. Emery has made a comprehensive series of experiments in the hope that the presence of acetic acid in Indian gum and its absence in tragacanth under the same treatment might serve as an indicator. Although disappointed in the hope that under like treatment tragacanth might fail to yield this acid, these experiments demonstrate that, while both kinds of gum will develop acetic acid under the treatment to be described, the yield of volatile acid by gram of samples of tragacanth and of Indian gum (*Sterculia urens*) is fairly constant, sufficiently so to serve, in conjunction with other well-known tests, as a very reliable criterion for establishing the purity or quantity of

either alone or in admixture, the "volatile acidity" of Indian gum (*Streculia urens*) as compared with that of tragacanth being nearly 7.5 as great. Omitting the details of the method of estimating the acetic acid, which must be consulted in the original, the procedure employed is as follows:

Treat 20 grams of the whole gum first in the cold with 200 Cc. of distilled water and 10 Cc. of sirupy phosphoric acid until completely swollen, then subject for several hours to the full heat of a steam bath, whereby the mass gradually becomes partly liquefied, then distill the product with steam and evaporate the distillate to dryness in the presence of barium carbonate. Treat the residue with a little hot water, filter, and distill the filtrate, amounting to about 30 Cc. with steam after the addition of 5 Cc. of sirupy phosphoric acid. On treating the distillate with silver oxide and filtering, characteristic plate-like needles are obtained, which on ignition prove to be silver acetate.

By the quantitative volumetric method described in detail by the author, 35 samples of tragacanth yielded figures showing a "volatile acidity" of 3.2 to 4.2—the average being 3.6 Cc., equivalent to 2.15 per cent. of acetic acid, while 21 samples of powdered tragacanth gave an average of 3.7 Cc. of "volatile acidity," equivalent to 2.20 per cent. of acetic acid. Indian gum (9 samples whole and 14 samples powdered) showed an average "volatile acids" of 26.7 and 26.5 Cc., equivalent to 15.91 and 15.79 per cent. of acetic acid respectively.—*Amer. Journ. Pharm.*, Sept., 1912, 393-398; from *Circ. 94*, Bureau of Chemistry, U. S. Dept. Agriculture.

Trifolium Repens—*Presence of a Cyanogenetic Glucoside*.—The experiments of M. Mirande demonstrate that the ordinary clover, *Trifolium repens*, will yield hydrocyanic acid from pre-existing principles in the plant. The author's experiments have, however, been made only with the wild plant, and have as yet been limited to the determination of the hydrocyanic acid liberated by the ferment present in its tissues when the bruised material is macerated in water and distilled. Clover leaflets gathered in August yielded 0.012 per cent. of HCy, the petioles 0.0025 per cent. and the stems 0.0010 per cent., while in the roots (examined in September) none was found. Clover leaflets from many different districts, subsequently examined, were found to vary enormously in the yield of prussic acid, however, the maximum yield being 0.0391 per cent. and the minimum 0.0033 per cent.—*Pharm. Journ. and Pharmacist*, Nov., 1912, 553; from *Compt. rend.*, 155 (1912), 651.

Trifolium Repens—*Hydrocyanic Acid in White Clover*.—Prof. Leon Guignard, dean of L' École supérieure de pharmacie in Paris, has discovered hydrocyanic acid in white clover. It is well known that fatal results often follow the transfer of sheep from a field of grass to a field of young clover. Hitherto this has been attributed to the animals gorging themselves with the sweet young leaves, this being followed by fatal distension of the stomach. If Prof. Guignard's theory is correct, then HCN may have been the real cause of death in many of such cases.—Ch. and Dr., 1912, 651. (O. R.)

TEREBINTHACEÆ.

Rhus Toxicodendron—*Value of Tincture of Bloodroot as a Remedy*.—John R. Jackson draws attention to an article on poisoning by *Rhus toxicodendron* by an American correspondent in the "Gardner's Chronicle," who says that very few people seem to be injured by the plant when it is dormant, although he himself is at all times susceptible to the poison. He cites that last summer, when rhus was just budding forth with blood-red shoots, four men were employed to root it up. These men were seemingly immune until hot weather set in, and when perspiration was free all were affected. The physician recommended as a remedy a tincture of bloodroot (*Sanguinaria canadensis*) sopped on with cloth. Each man was cured in four days by the use of this simple remedy.—Chem. and Drugg., Jan. 6, 1912, 31.

Rhus Toxicodendron—*Source of Poisonous Action*.—According to the studies of Dr. Rost and Prof. Gilg the poisonous action of *Rhus Toxicodendron* is attributable to a resinous secretion, but only manifests itself when the secretion comes in direct contact with the skin. The transmission of the poison by particles of the plant carried by the wind, or by emanations radiating from the plant itself, is out of question.—Pharm. Ztg., lvii (1912), No. 31, 313.

PIPERACEÆ.

Cubebs—*Examination of Sorts found on the Market*.—The occurrence on the market of an abnormal sample of cubeb oil which had been distilled from cubebs imported from Macassar into Amsterdam, prompted J. C. Umney and H. V. Potter to make some inquiries as to the cubebs on the London and other markets, and also the powders produced from them. Although the cubebs in question appeared in most respects normal, the odor was decidedly mace-like, and the optical rotation of the oil distilled from them was

much below the usually accepted limits, being -14° in place of -30° . The authors communicate the particulars of an examination of nine samples of these fruits (one of them in form of powder) which are shown in a table with comments. According to their observation, extending over a number of years, the normal extractive (obtainable by ether) of the finest cubebs, practically free from stalks, as imported from the East Indies, is 20 to 25 per cent. Only four of the samples—one of them the powder—yielded 20 or more per cent. of extractive to ether and three of these had a normal odor, one of them having a slight mace odor. All the others, yielding extractive ranging from 10.24 to 17.26 per cent., had a more or less pronounced mace odor. One sample contained 46 per cent. of stalks. This had a nearly normal odor, but yielded the smallest percentage of extractive of all (10.24%), which is accounted for by the fact that the stalks, examined separately, yielded only 2.88 per cent. of extractive. With a single exception, all the samples gave the characteristic crimson color-reaction with concentrated H_2SO_4 . The authors propose to continue their investigation, both as regards the chemical and microscopic distinctions of the fruits under examination.—Chem. and Drugg., Mar. 2, 1912, 331.

Cubebs—Chemical and Microscopical Investigation.—The results of the further investigation of the various samples of cubebs referred to in the preceding abstract, have brought to light some important facts in connection with this drug. Out of the eight samples of fruits from various sources three have proven to be false, while a fourth appeared to be a mixed sample of genuine with spurious fruits. The grounds on which these fruits are pronounced as genuine or false are explained in detail by the results of the chemical experiments made and of their microscopic characters, which are exhibited in a number of cuts illustrating the present paper. From these observations it becomes apparent that there are various species of "peppers" which have in recent years been sold as genuine cubebs, and that the detection of these spurious varieties is a matter of some difficulty. It may be safely stated, however, that those fruits which yield extractives having a mace-like odor are not genuine, and are evidently some other species of cubebs.—Ibid., March 23, 1912, 443.

False Cubebs—Character of Volatile Oil Distilled from Them.—Umney and Potter have distilled the volatile oil from two of the samples of false cubebs described in the preceding abstract, which proved to have an entirely different composition from that of nor-

mal cubeb oil. The odor was decidedly "macey"; sp. gr., 0.894; opt. rotation, $+16^{\circ}$; sapon. number, after acetylation, 56.1. Oil distilled from genuine fruits had the normal odor of cubeb; sp. gr., 0.917; opt. rotation, -43° . A mixture of the two oils in equal parts had approximately the characters of abnormal cubeb oils recently offered on the market, namely a rotation of -16° and a sp. gr. of 0.910.—Ibid., March 30, 1912, 479.

Cubebs—Method of Identification.—Confirming the observation of Umney and Potter that cubebs offered on the market, particularly such imported via London, have recently been frequently sophisticated with different sorts of pepper-fruits, Cæsar and Loretz state that they have recently met with a consignment containing scarcely any genuine cubebs but large quantities of *Piper nigrum*. They confirm furthermore the statement of Umney and Potter that the fruits used for sophisticating cubebs are difficult to distinguish in their externals from the genuine fruits, but they have resorted with advantage to the sulphuric acid test, which is carried out as follows: The fruit is triturated in a small mortar to fine powder, the powder transferred to a small plain filter (4 Cm. diameter), and 1 or 2 Cc. of ether is poured upon the powder. The filtrate is collected in a small porcelain dish, allowed to evaporate spontaneously, 1 or 2 drops of sulphuric acid are added to the residue and the two are stirred together with a glass rod. A handsome purple-red color is developed and this is intensified if 1-2 Cc. of ether is poured upon it and evaporated by moving the dish to and fro on the hand. False cubebs subjected to this test give a dirty brown color. The test should be carried out simultaneously with several fruits of different appearance.—Pharm. Ztg., lvii (1912), No. 84, 845; from Cæsar & Loretz's Ann. Rep., 1912.

Cubebs—Review of the True and the False.—E. M. Holmes remarks that the cubebs of the B. P. have always been subject to more or less adulteration, or to admixture by other species of the same genus. The difficulty of distinguishing these from the genuine, except under the microscope, has probably enabled the sophistication to be practiced with a considerable amount of success. Two facts have, however, led to a more careful examination of these fruits than would otherwise have been the case; one is that a certain variety of cubebs was found to give rise to symptoms of poisoning, and the other that the volatile oil derived from one of the substituted species differed so greatly in its odor and in physical and chemical characters that it could not possibly pass, in these days of a wider

knowledge of the volatile oils, as that of cubebs. In view of these facts, and that the literature and illustrations of the spurious cubebs are so scattered as not to be conveniently consulted, Mr. Holmes considers it generally useful if the leading features of the genuine drug and of the various substitutes and adulterations that have hitherto appeared are brought together in one paper so as to be available for ready reference. It is impracticable of course to give the details of this interesting paper, and it must suffice here to briefly refer to the true and false cubebs mentioned by the author, leaving the details of description for consultation in the original.

Of the thirty-nine species of *Piper* having stalked fruits, which for convenience have been placed by Miguel under the genus *Cubeba*, only three can be regarded as "true cubebs." These are known by the natives in Java, where they are cultivated, by the name of *Rinoe Katoentjar*, *Rinoe tjaroclock*, and *Rino badak*, and apparently without recognition of any difference in their properties. Of these, the variety called

Rinoe Katoentjar constitutes the official cubebs, which are distinguished as follows: The wrinkled fruit is of a blackish color, often with a bluish tint, the diameter of the head of the fruit is usually 5 Mm. and the length of the stalk about 5 Mm. The taste is faintly bitter, with the characteristic flavor of cubebs. When crushed and a drop of strong sulphuric acid added a rosy carmine tint is developed, due to the presence of cubebin. This is quite characteristic of genuine cubebs, as it fails with all the adulterations and substitutions hitherto found in cubebs, which only give a yellowish-brown coloration.

Rinoe Tjaroclock is a variety which the author refers to the long-stalked form that commonly occurs in commercial cubebs. The stalk is uniformly about 7 Mm. long, and it presents also some slight microscopic differences from *katoentjar* cubebs, but agrees in the sulphuric acid test. For practical purposes it differs in nothing except the longer stalk, and is almost invariably mixed with the official kind.

Rino Badak, on the other hand, differs externally in its greyish tint and slightly larger size, being almost uniformly 6 Mm., with a stalk of equal length. It has a distinct mace-like odor, and gives a yellowish-brown color with sulphuric acid. Moreover, it has poisonous properties and, being often mixed with genuine cubebs, makes the powder of this mixed cubebs liable to cause vomiting and diarrhoea and symptoms of poisoning.

False Cubebs, which include not only other species of cubebs, but fruits derived from other natural orders, are considered in the present paper only when they belong to the same natural order and have stalks like those of true cubebs. The author mentions and briefly describes the following:

Piper Crassipes, Korthals, the largest of the false cubebs that have been imported into Great Britain, has a stouter and flatter pedicel, twice as long as the first, an agreeable odor, different from that of common cubebs, and a very bitter taste.

Piper Ribesioides, recently occurring in English commerce, is characterized by a yellowish or brownish-grey tint, less pungency to the taste than that of true cubebs, and not so bitter as *Piper crassipes*.

Piper Mollissium, a cubeb-like fruit was sent some years ago from Goerlitz, under the name of "Keboe cubebs" by Dr. T. Schuchardt. It is of a dusky-grey tint, has a longer stalk than *P. crassipes*, and differs microscopically from all those previously mentioned in having no endocarpic stone cells. Two other false cubebs, belonging to a group which is characterized by being devoid of endocarpic stone cells, have been described,—the one by Vogl, which is apparently identical with the

Faux Cubébe de Java, of Planchon and Collin, which is evidently allied to *P. Mollissium*; the other which is figured by Planchon and Collin under the name of

Cubébe de Java, Sauvage, which may possibly belong to *Piper venosum*, C. D. C., or *P. muviaticum*, in both of which the stalks are shorter than the fruit. Finally,

Piper Lowong is a fruit mentioned in "Pharmacographia" as a native of Java and extremely cubeb-like. In this the endocarpic stone cells are also absent.—Pharm. Journ. and Pharmacist, May 11, 1912, 604-605.

Cubebs—Microscopic Examination of Genuine, False and Commercial Varieties.—At the request of Mr. E. M. Holmes to investigate the microscopic characters of the different varieties of cubebs in commerce, Mr. James Small made an examination of commercial samples as compared with authentic herbarium specimens and reports his results, illustrated by drawings exhibiting the microscopic features of the several samples. Six varieties gave the red reaction and therefore agree with the typical form in this respect (see the preceding paper of Mr. Holmes). As it is uncertain whether these are to be regarded as distinct species or only varieties of the official

drug, they are classed by the author under *Piper Cubeba*, the native name and the district from which they have been obtained. It must suffice here to simply to mention the different varieties examined by their titles, with such specification as are necessary for their identification, referring to the original papers for the description of their microscopic characteristics.

GENUINE CUBEBS.

1. *Piper Cubeba*, var. *Rinoe Katoentjar*; two types, distinct in the microscopic section of the fruit—the one “narrow-leaved,” the other “broad-leaved.” 2. *Piper Cubeba*, var. from the town of Purworejo. 3. *Piper Cubeba*, (var. “*Rinoe Tjaroelock*,” ?), supposed by Mr. Holmes to be the variety *tjaroclock*, but not so named in the Herbarium of the Society. It comes from the district of Djokjokarta. 4. *Piper Cubeba*, var., from the Kediri district. 5. *Piper Cubeba*, var., from the town of Malang.

FALSE CUBEBS.

This term is applied by the author to the cubebs met with which do not give the red reaction with sulphuric acid.

1. *Piper Cubeba*, var. *Rinoe Badak*; two types. 2. *Piper Ribesoides*, an authentic specimen from the museum. 3. *Piper Crasipes*?, a specimen from the museum. These four samples gave a yellow-brown with strong sulphuric acid. The author also examined five

COMMERCIAL SAMPLES OF CUBEBS.

Four of these were grossly adulterated with the fruits of *Rinoe badak*, while the genuine fruits were derived from the two varieties *Rinoe Katoentjar* and *R. tjaroclock*. The paper is accompanied by nine microscopic drawings.—Pharm. Journ. and Pharmacist, May 18, 1912, 639-641.

Kava Resin—Estimation in Admixtures with Sandal Oil.—The resin of kava roots has during recent years been frequently employed as an antigonorrhoeic in combination with sandalwood oil, such combinations being usually exploited as trade-named specialties. Having frequent occasion to determine the resin content in such mixtures, Dr. Aufrecht has experimented with the object of finding a reliable method for its estimation, the only published method being one given in the 1911 Report of J. D. Riedel by an unnamed author, which is based upon the sparing solubility of the resin in petroleum ether. Preliminarily, Dr. Aufrecht prepared

an alcoholic extract, and from this by extraction with ether the crude resin, amounting to 5.70 per cent. of the Kava root employed when completely dry. This crude resin had the following composition: Soluble in petroleum ether, 5.05 per cent; resin (insoluble in petroleum ether), 91.5 per cent.; extractive substances, 3.39 per cent.; ash, 0.06 per cent.; volatile oil, traces. After trying the method proposed in Riedel's Report and finding it unreliable, the author eventually devised a method which he recommends as reliable. This consists in saponifying the mixtures of kava-resin and sandal oil with alcoholic potash, heating on a water bath to remove the alcohol completely, dissolving the saponified mixture in boiling water, transferring the solution and rinsings into a flask, acidifying it with dilute H_2SO_4 , and distilling until the distillate passes perfectly clear. The residual acid-resins in the flask, representing both the free resin and the esterified resin, are then collected on a tared filter, washed, and dried to constant weight. In the experiments recorded, the method is found to be correct within 1.52 per cent., as an average of three determinations.—Pharm. Ztg., lvii (1912), No. 10, 92-93.

RHAMNACEÆ.

Rhamnus Cathartica—*Examination of the Bark*.—Tschirch and Bromberger have made a careful examination of 15 kilos of this bark and found the following constituents:

1. Rhamnosterin. From the hot (90%) alcoholic extract, separating as brown body, on cooling of the fluid and after purification by repeated crystallization from alcohol (decolorizing with animal charcoal) appearing in almost white granules. It has the formula $C_{13}H_{28}O_2$, melts at 83° - 85° and is a physosterin.

2. Rhamnofluorin, which is contained in the smeary precipitate separating when the alcoholic filtrate from the rhamnosterin is concentrated and poured into water. The precipitate is dried and extracted in a Soxhlet with benzene, the benzene solution on cooling depositing a red "Lack" which consists of emodin (which is removed by extraction with ether) and the rhamnofluorin, which is purified by sublimation and crystallization from pyridine. It is an ash gray solid, blackening without melting at 220° , showing fluorescence in alcoholic and ammoniacal solutions, does not reduce Fehling's solution, and has the formula $C_{14}H_{12}O_6$.

3. Emodin. Extracted with ether as above described and purified by washing with pyridine and crystallizing from alcohol. Anal-

ysis, both of the purified body and its tri-acetyl derivative shows it to be *Frangula-emodin* $C_{15}H_{10}O_5$.

4. *Iso-emodin*. Obtained from deep red mother liquor from the emodin crystallization, by acetylizing and purifying the acetyl derivative (m. p. 233°) and saponifying gave a crystalline body dissolving in alkali with violet-blue tint, blackening without melting at 305° and showing on combustion the formula $C_{15}H_{10}O_5$.

5. *Chrysophanol*. This pure chrysophanic acid is obtained from the benzene mother liquor from which the emodin and rhamnofluorin have separated. The benzene is distilled off and the thick liquid residue is dissolved in hot absolute alcohol and from this solution, on addition of water, a smeary mass precipitates. Crystallization from pyridine and treatment with a solution of soda (in which the chrysophanol is insoluble while impurities dissolve) yields methoxyl-free chrysophanic acid melting at 196° and having the formula $C_{14}H_8O_2 (CH_3) (OH)_2$.

6. A body reducing Fehling's solution was obtained from the watery fluid after precipitation of the chrysophanol from its alcoholic solution, but in too small a quantity to characterize.

7. *Dextrogyrate Glucose*, sugar, tannins and fat were also obtained.—*Schweiz. Wschr. f. Chem. u. Pharm.*, 1 (1912), No. 14, 193. (H. V. A.)

CELASTRACEÆ.

Catha Edulis—*Active Constituents of the Leaves*.—The leaves of *Catha edulis*, a shrub indigenous to Abyssinia, have long been used as a stimulant beverage by the native of Abyssinia, Arabia and Somaliland, like coffee, even antedating the use of the latter. The leaves are known as "Kat" (also kath, gnat, gat, tschat, tohat, and many other variants), the drink as "Kafta," and in the social life of Abyssinians and Arabians they play much the same rôle as tea, coffee, coca, and other well-known stimulant-narcotics do among other peoples. Dr. Ralph Stockman, who speaks interestingly of the history, varieties, uses and commercial relations of this drug, has subjected some leaves received from Arabia to proximate examination with the purpose of determining the nature of the active constituent or constituents, and has succeeded in isolating three distinct alkaloids, which he has named, respectively, cathine, cathidine, and cathinine. Besides the alkaloids, the leaves contain a relatively large amount of a sweet fermentable sugar which reduces Fehling's solution, a tannin giving a green-black color with ferric chloride, a small quantity of caoutchoue soluble in chloroform, a waxy sub-

stance extracted by kerosene, and a small quantity of a yellowish volatile oil having a pleasant odor and flavor. The isolation of the alkaloids is rendered difficult owing to the ease with which they are decomposed during extraction. The author outlines the method of preparation of the free alkaloids and their respective sulphates, and describes them as follows:

Cathine was obtained in the form of small needle-shaped and feathery crystals mixed with more or less gummy alkaloid. It is very soluble in water, and has a bitter taste; very soluble also in chloroform, in absolute and diluted alcohol, benzol, amyl-alcohol, and acetone, but insoluble in ether and in petroleum ether.

Cathine Sulphate, when crystallized from watery solution, forms small needle-shaped crystals, neutral in reaction, and readily soluble in water and diluted alcohol, but insoluble in absolute alcohol as well as the organic solvents in general. Its aqueous solution is bitter, and given the usual alkaloidal reactions.

Cathidine is a white amorphous powder, insoluble in cold and hot water and in petroleum ether, but freely soluble in ether, absolute alcohol, acetone, chloroform, acetic ether, benzol, tolnol, and xylol; somewhat less soluble in amylic alcohol, and precipitated from its alcoholic solution on addition of water. It is not readily soluble in weak acid solutions, but dissolves in strong acids, its acid solutions giving the usual reactions for alkaloids, and has a bitter taste. It is, however, a weak base, and no sulphate has been prepared from it.

Cathinine, the third base, is obtained from its sulphate by adding an alkali and extracting with chloroform, which leaves it on evaporation as a colorless semi-crystalline or amorphous mass, not very soluble in cold water, but forming a strongly reactive alkaline solution of a bitter taste. It is much more soluble in hot water, and very soluble in acetone, absolute and dilute alcohol, acetic ether, chloroform, and amylic alcohol, fairly soluble in ether, scarcely soluble in benzol, and insoluble in petroleum ether.

Cathinine Sulphate crystallizes from water in rosettes of needle-shaped or feathery crystals. It is readily soluble in cold water, forming bitter solutions, with difficulty soluble in absolute alcohol, and insoluble in ether, chloroform, acetone, etc. It gives the usual reaction with alkaloidal reagents.

Regarding the physiologic action of the three bases, of which a full account will be given in the "Journal of Pharmacology," the author observes that *cathine* has an action on the nervous and muscular system of the frog something like a combination of the

actions of morphine and caffeine, while *cathinine* has not the same drowsy or depressing effect on the brain, but is more of a stimulant to the spinal cord. In large doses both paralyze the terminations of motor nerves. *Cathidine* is a muscle poison and a slight stimulant to the nervous system.—Pharm. Journ. and Pharmacist, Nov. 30, 1912, 676-678.

Euonymus Atropurpureus—*Chemical Examination of the Root-Bark*.—A résumé of the literature showing that with the exception of the dulcitol no definite constituent has heretofore been isolated from "wahoo" bark, Harold Rogerson has made a complete chemical examination of the drug and summarizes his results as follows:

The material employed consisted of the root-bark of *Euonymus atropurpureus*, Jacquin. An alcoholic extract of this material when distilled in a current of steam yielded an amount of a pale-yellow essential oil, equivalent to 0.01 per cent. of the weight of the drug.

The portion of the extract which was soluble in water contained a quantity of dulcitol (m. p. 186-188°) amounting to 2.09 per cent. of the weight of the drug; a new acid, $C_5H_4O_3$ (m. p. 121-122°), which evidently is *furan- β -carboxylic acid*; a new crystalline alcohol, $C_{21}H_{36}O_4$ (m. p. 248-250°), which possesses a bitter taste, and has been designated *euonymol*; and a sugar which yielded *d*-phenylglucosazone (m. p. 208-209°), together with small amounts of tannin and coloring matter.

The portion of the extract which was insoluble in water consisted of a dark brown resin, amounting to 3.2 per cent. of the weight of the drug. From this resin the following substances were isolated: Three new alcohols, namely, *euonysterol*, $C_{31}H_{51}O.OH$ (m. p. 137-138°), *homo-euonysterol*, $C_{40}H_{69}O.OH$ (m. p. 133-134°), and *atropurol*, $C_{27}H_{44}(OH)_2$, melting at 283-285°; *citrullol*, $C_{22}H_{36}O_2(OH)_2$ (m. p. 285-290°), which has previously been obtained from colocynth (J. Chem. Soc., 1910, 97, 102) and a mixture of fatty acids consisting of palmitic, cerotic, oleic, and linolic acids.

In the course of this investigation no product could be obtained corresponding to the "euonymin" of Wenzell or of Schmiedeberg, and moreover, there was no evidence of the presence of any glucosidic substance in the bark.—Pharm. Journ. and Pharmacist, May 25, 1912, 687; from Communication of the Wellcome Research Laboratories.

EUPHORBIACEÆ.

Rubber Planting in Malaya—An Interesting Account.—C. B. Kibble writes entertainingly about the cultivation of rubber trees (*Hevea Brasiliensis*) and the collection and preparation of rubber from them in Malaya, his account being highly interesting in the light of the recent developments regarding the collection of rubber in South America and of the atrocities practiced in the remote Peruvian districts in the upper Amazon region. Speaking from personal observation, he says that all over the State of Perak large tracts of jungle land have been, and are still, in process of being cleared, in order to plant rubber; and there are many extensive plantations run by Europeans (both individuals and companies), as well as numberless small plots owned and worked by Malays, Chinese, or Tamils. The first cuttings and seeds of *Hevea* were sent from Ceylon to the Straits Settlements, and from the trees so obtained seeds were distributed to other parts of Malaya. The first record found by the author of such specimens being dispatched is in 1877, when cuttings from one-year-old trees were sent from Peradynia—this statement being apparently confirmed by the age of the largest trees which were said to be twenty-five or thirty years old. As regards the labor on the large estates, the work is usually done by Tamils, who are recruited in India and shipped over in gangs; but there is nothing like slavery about this, for they are well paid and treated, and have special officials set apart to explain to them the conditions under which they are engaged and to investigate their grievances. Owing to the favorable climatic and soil conditions prevailing, trees are ready for tapping when from three to five years old, the determining factor being the size, not age. The bark is first incised when the trunk has attained a circumference of at least fifteen inches, at a height of three feet from the ground, the usual method of sapping being first a “Y” and then the “quarter herring bone.” The cups in which the latex is collected are now usually of pretty highly glazed earthen ware, these having superseded glass cups, they in their turn replaced tins, and these probably the original cocoanut shell. The tappers go their rounds early in the morning, and the day’s yield has been brought well in before mid-day. After the latex has been strained and measured, it is coagulated, usually by the addition of acetic acid. The coagulated latex, after being washed and pressed, is either made into crêpe or lace, or left as sheet or biscuit rubber. In the former case, expensive and up-to-date machinery is used; in the latter nothing more exciting than an ordinary hand mangle is required. Before

being packed the coagulated and pressed rubber is thoroughly dried and smoked, the finished product being a warm, dark red-brown color, and just transparent when held up against the light. Smoking is usually done by hanging the rubber up, or laying it on open grating shelves in a hut, and lighting a fire of cocoanut husks beneath. The present outlook is that in another ten years' time there will be miles of mature rubber trees in Malaya.—Pharm. Journ. and Pharmacist, Jan. 20, 1912, 61-62.

Old India Rubber—Regeneration by Means of Terpeneol.—Ordinary solvents have little action on used rubber, especially if vulcanized, and the utilization of old rubber is a difficult problem. According to "Rev. scientifique," however, terpeneol is found to be an excellent solvent and is applied in the following way: Two parts of terpeneol and one part of the rubber are heated together in a closed vessel at a temperature above 100°. The solution is shaken with four volumes of petroleum spirit, and the mixture after decantation is distilled. The residue after treatment with alcohol and acetone closely resembles raw rubber; it is resistant to chemical agents and allows of the addition of mineral substances, and so may be revulcanized.—Pharm. Journ. and Pharmacist, Aug. 3, 1912, 160; from Rep. de Pharm., 1912, 6, 286.

Synthetic Caoutchouc—Chemical Identity with the Natural Product.—At the recent Jubilee meeting of the Society of German Chemists one of the most interesting topics of discussion was the advance made in the synthetic production of medicinal and technically useful products. Among the latter the most important doubtless is the successful synthetic production of caoutchouc, the history of which was traced by C. Harries, whose personal researches within the last few years have confirmed the chemical identity of the synthetic and the natural product. While "isopren," which is regarded to be the basis of the synthetic article, has been known for 50 years, the first successful caoutchouc production was by Boucharlat and Tilden 20 years ago, who obtained it by the action of HCl on isopren; but, strange to say, the method described has not since been confirmed as available for its production by other investigators, although priority of discovery has been conceded to the first named investigators. During the past two years the problem of its synthetic production has, however, been solved by Harries in collaboration with the "Elberfeld Farbenfabriken." The material from which the caoutchouc is produced consists of unsaturated hydrocarbons, which are cheaply and conveniently available, and these hydrocarbons are polymerized by a series of methods devised for

the purpose, which are characterized by the author as "ozonizing methods." The chemical identity of the synthetic and natural products is demonstrated by the solubility in various solvents and a series of well-defined properties of the ozonide, which must yield on hydrolysis with H_2O the same cleavage curve and the same products of hydrolysis in the same proportions as does the natural caoutchouc. Some slight deviations from these conditions still remain to be obliterated, but the author is confident that the results so far obtained will lead to the successful production of synthetic caoutchouc as a large industry in the near future.—Pharm. Ztg., lvii (1912), No. 46, 459.

Chinese Wood Oil—Standardization by Means of the Heat Test.

The Berlin Produce Exchange Committee on Fats and Oils proposes the following temporary standards for Chinese wood oil:

Wood Oil from Hankow and Shanghai shall be regarded as of good merchantable quality if, after being heated to from 282° to 293° C., it sets hard in six to six and a half minutes, can be cut dry, and is firm in consistence without being sticky or altered in color.

Wood Oil from Canton or Hong Kong should become hard in four and a half to five and a half minutes. The question of purity is left out of consideration, but if so-called pure oil takes longer than the periods mentioned to become hard, the purity must be ascertained by other tests.—Pharm. Journ. and Pharmacist, July 27, 1912, 99; from Oil and Col. Trades Journ., July 13, 1912, 136.

Chinese Wood Oil.—Value and Method of Carrying out the Heat Test.—Frank Browne, Government Analyst, Hong Kong, observes that the quality of Chinese wood oil is determined to a large extent by its well-known characteristic property of forming a jelly when heated to and maintained at a temperature of 250° C. for a few minutes, but that different observers usually employ different temperatures, so that results are not easily comparable. In view of the large and increasing export of this oil, it seems very desirable to arrange a heat test which can be repeated by both buyer and seller in any part of the world, and with this object he has devised a method which insures that the heating is carried out in an identical manner, describing the apparatus necessary as well as the process itself in detail. Employing a temperature which is maintained as close as possible at 282° C. (540° F.), he obtained concordant results when operating on seven samples of pure oils in conformity with the details described by him, these showing that the time of setting varied from eleven to thirteen minutes. For a wood oil con-

taining 10 per cent. of adulterant, the times varied from thirteen to fifteen minutes, and with 20 per cent. of adulterant from sixteen and a half to nineteen minutes. The results, which are given in detail in several tables, show that a heat test carefully applied is of considerable help in ascertaining quality. If the time required does not exceed twelve and a half minutes the oil is in all probability genuine; if more time is required further examination is desirable.—Chem. News, July 12, 1912, 14-15.

URTICACEÆ.

American Grown Cannabis—Comparison with Samples from Various Other Sources.—Introducing a comprehensive study of American grown Cannabis in comparison with Cannabis from other sources, C. R. Eckler and F. A. Miller remark that several factors have recently given rise to considerable comment on this subject. Of these, perhaps the most important are: The increased cost of the Indian product; the unsupported claims made by some investigators, leading to a false conception of the activity of commercial lots of the drug; the question as to whether or not an active variety can be successfully cultivated in this country on a commercial scale, and the question of the feasibility of including the American variety in the U. S. P. IX. The influence upon the activity of the drug of such factors as soil, climate, geographical location, time of harvesting, method of curing, and parts of plant included are also of interest. These various points are considered in the course of the author's study; the details of numerous experiments, such as chemical and physiological tests and the methods employed, are given, together with approximate values of the different kinds of Cannabis examined, the results leading to the following conclusions:

Soil, climate and geographical location have a decided influence upon the activity of American and Indian Cannabis.

Repeated plantings from carefully selected seeds of American and Indian Cannabis have failed to yield a product testing over 65 per cent. as active as good Indian grown drug, while the majority of the plantings tested 50 per cent. and less.

Commercial samples of American Cannabis were found to vary widely in their activity. None were as active as good samples of the Indian drug, and a number not more than 50 per cent. as active.

Commercial samples from various foreign sources were supplied upon request for samples of Cannabis Indica. None of these were equal to the Indian drug and some tested extremely low.

Commercial samples of fluidextracts of American Cannabis vary widely in their activity, some being not more than 50 per cent. as active as Indian fluidextracts of the same makers.

In addition to physical and botanical characteristics, the physiological assay is of greatest importance in judging the quality of the drug. Very little dependence can be placed on the estimation of the extractive matter yielded to alcohol.

The results of this work indicate that if American Cannabis is made official, difficulty will generally be experienced in obtaining highly active lots which will compare favorably with good Indian drug.—*Amer. Journ. Pharm.*, Nov., 1912, 488-495; from *Proc. Eighth Intern. Congress of Applied Chem.*, xvii, p. 23.

Hops—Kiln-drying at High Temperatures.—The large area of many of the American hop fields and the consequent vast bulk of the crops has led to the practice of employing much higher temperatures for kiln-drying the hops in order to hasten the process, than is employed in Europe. H. V. Tarter and B. Pilkington have now experimented to ascertain whether the high temperature employed, reaching as high as 145° F. is, as has been averred, injurious to the hops, lessening the percentage of soft resin and increasing the valueless hard resin. They find, however, that this is not the case. The same hops, air dried at room temperature, and kiln dried at 145° F. showed no appreciable difference in their resin constituents nor in their aroma.—*Journ. Ind. and Eng. Chem.*, 4 (1912), 840.

CONIFERÆ.

Abies Pectinata—Volatile Oil of the Seeds.—The receipt of a small parcel of seed from *Abies pectinata* afforded Schimmel & Co. an opportunity of distilling the volatile oil from them direct, whereas ordinarily the seed is worked up together with the cones. As the cones owe their oil principally to the enclosed seeds, it was to be expected that the oil yield from the seed alone would be very high and that the distillate would agree completely in characters with the ordinary oil from the cones, and these anticipations were confirmed; but it was necessary to crush the seeds before placing them in the still, since the uncrushed seeds yielded only 2.3 per cent. of oil, whereas the crushed seeds yielded from 12 to 13 per cent. As expected, the constants were those of the oil from cones, ranging within the following limits: Sp. gr. 15°, 0.8629 to 0.8668; opt. rot., —68°14' to —76°38'; refr. index 20°, 1.47636 to 1.47812; acid val., 0.5 to 1.8; ester val., 0.9 to 3.7, corresponding to 0.3 to 1.3%

bornyl acetate; soluble in 5 to 7 vols. and more of 90 per cent. alcohol.—Schimmel's Rep., Oct., 1912, 94.

The Balsam from Abies Cephalonica.—E. J. Emanuel describes this balsam and the tree from which it exudes; the tree growing on the Grecian island of Cephalonia, where it forms beautiful forests. The peasants use the balsam (in pills) as a purgative, and apply it externally (in salves) for skin troubles and also use it in plasters. The resin has a characteristic odor; a bitter taste; direct acid number 113.5, and an indirect one, 128.3; a cold saponification number 137, and a hot saponification 157.

Analysis showed the following constituents:

1. *Elastic Acid* (5.2%), a monobasic acid, $C_8H_{12}O_2$, m. p. 124-126°; acid numbers, direct 393, indirect 396.9; saponification numbers, cold 405; hot, 411.6; soluble in ammonium carbonate solution.

2. *Elatinic Acid*, a monobasic acid $C_{12}H_{18}O_2$, m. p. 78-80°; acid numbers, direct 281.4, indirect 287.3; saponification numbers, cold 296, hot 302.4; soluble in sodium carbonate and precipitated by lead acetate.

3. *Elatinolic Acid*, a monobasic acid $C_9H_{16}O_2$, m. p. 118-120°; acid numbers, direct 360; indirect 361.5; saponification numbers, cold 369.6, hot 382.2; soluble in sodium carbonate and not precipitated by lead acetate.

The last two acids constitute 70 per cent. of the balsam, while each of the three acids forms a mono-iodine derivative and a silver salt.

4. *Ethereal Oil* (17.4%) which was separated into three fractions (a) b. p. 89-150°, colorless liquid smelling like turpentine; (b) b. p. 150-155°, also colorless and of turpentine odor; (c) b. p. 155-175°, yellow and of empyreumatic odor. The combined oil had density 0.9279 at 15°, polarization index —68 in 200 Cm. tube and refractive index, 1.4743 at 13.5°.

5. *Resen* (1.04%), a yellowish mass soluble in alcohol, m. p. 92-96°, having the composition $C_{24}H_{42}O$.

6. *Bitter principle* (trace) giving brown preceipitate with ferric chloride, a gelatinous brown one with lead acetate and a brown color but no precipitate with tannin.

Destructive distillation gave four only fractions (containing no succinic acid) and a charred residue.—Arch. d. Pharm., 250 (1912), No. 2, 104. (H. V. A.)

Gum Thus or Canadian Olibanum—A Substitute for Olibanum.—Karl Dieterich reports on an American substitute for olibanum, which comes into the drug market from Hamburg. Its m. pt. is 77-78°. The following are its constants as compared with *Resina Pini* and *Terebinthina*:

	Acid Number	Saponif. Number
Gum thus.....	145.64 to 146.03	169.19 to 170.78
Pine resin.....	105 to 160	150 to 190
Turpentine	104 to 144	108 to 179

The yield of oil of turpentine is as follows:

Gum thus.....	9-10%
Pine resin.....	3- 4%
Turpentine	20-25%

Consequently Gum Thus occupies a place about midway between *Resina Pini* and *Terebinthina*. The conclusions reached are that Gum Thus is a valuable American pine resin, which, however, contains no gum and therefore is not a gum resin.—Ph. Zhalle, 1912, No. 24, 652-654. (O. R.)

Southern Cypress—Constituents of the Oil from the Cones.—Allen F. Odell gives as the analysis of the oil from the cones of the southern cypress (*Taxodium distichum*, Rich.), the following values:

Dextro pinene 85 per cent., dextro linonene 5 per cent., a pseudo terpene alcohol (Sabinol?) 2 per cent., carvone 3 per cent., a tricyclic sesquiterpene 3 per cent., the remainder composed of substances boiling above 275° C. No aldehydes were found in the oil. J. Am. Chem. Soc., June, 1912, 34, 824. (L. A. B.)

Juniperus Barbadensis, L.—*A Useful West Indian Species.*—Attention is directed in "Kew Bulletin" to a West Indian cedar, *Juniperus barbadensis*, L., which is closely related to the East African species, *Juniperus procera*, Hochst, mentioned in last year's report (see Proceedings, 1911, 270). It occurs in the pine districts of Dominica, and also inhabits the other West Indian Islands, and the southern parts of North America. So far no oil has been distilled from the plant. Besides the *Juniperus* species mentioned, the pine forests of Dominica contain *Pinus occidentalis*, S. W., and *Xanthoxylum martinicense*, Lam.—Schimmel's Rep., April, 1912, 39.

Larch Turpentine—Characters of the Oleo-resin and Oil.—After repeated efforts Schimmel & Co. have succeeded to obtain, from an entirely reliable source, a sufficient quantity of larch turpentine for examination and distillation. This turpentine, after filtration, was clear, faint yellow, of a consistence just above the verge of

liqueescence, and had the following constants: opt. rot., $+29^{\circ}20'$; acid val., 69.5; ester val., 55.9; wholly soluble in three parts 80 per cent. alcohol; also in light benzin with exception of a few flakes. It yielded 13.5 per cent. of oil to steam distillation, with constants as follows: Sp. gr. 15° , 0.8649; opt. rot., $-8^{\circ}15'$; refr. index 20° , 1.46924; acid val., 0; ester val., 5.9; soluble in 6 vols. and more of 90 per cent. alcohol.—Schimmel's Rep., Oct., 1912, 111.

Pinus Oleoresins.—*Chemical Examination*.—L. Reutter has made a chemical examination of the oleoresins of *Pinus pinca* and of *Pinus Halapensis*, the latter obtained from Prof. Planchon's botanical garden at Montpellier.

Oleoresin of Pinus Pinca, which is not a commercial product, occurs in reddish or yellowish, opalescent, slightly aromatic, rounded or angular tears. It melts at $85^{\circ}\text{C}.$; acid value, 101.7 to 102.5; sap. val., 269.27 to 270.1; sparingly soluble in petroleum ether; about 66 per cent. soluble in ether, 75 per cent. soluble in chloroform, and 80 per cent. soluble in carbon disulphide, forming pinkish solutions, whereas its alcoholic solution is yellow. The ether soluble portion gave by Tschirch's method to ammonium carbonate solution 18 per cent. of a new substance *pinic acid* ($\text{C}_7\text{H}_{11}\text{O}_4$), melting at 99° to $99.5^{\circ}\text{C}.$, and to sodium carbonate another new crystalline acid, *pinolic acid* ($\text{C}_{16}\text{H}_{28}\text{O}_3$), melting at $86^{\circ}\text{C}.$ Other acids were also present, but could not be identified because of insufficiency of material. The oleo resin also contained 18 per cent. of *pincaresene*, 12 per cent. of volatile oil, and 15 per cent. of woody impurity.

Oleo Resin of Pinus Halapensis was received in form of a solid pale yellow mass, hard externally, softer inside, showing numerous micro-crystals and melting at 83° to $85^{\circ}\text{C}.$ Ether and benzol dissolved 75 per cent. only, but in other organic solvents it was almost completely soluble. Examined by Tschirch's method, the ether solution yielded to ammonium carbonate solution, amorphous *helepinic acid* ($\text{C}_{26}\text{H}_{40}\text{O}_4$), melting at 73.5° to $74.5^{\circ}\text{C}.$; to sodium carbonate solution, crystalline *helepinolic acid* ($\text{C}_{40}\text{H}_{56}\text{O}_5$), melting at 144.2° to $145.5^{\circ}\text{C}.$; amorphous α -*helepinolic acid* ($\text{C}_{34}\text{H}_{50}\text{O}_4$), melting at 80.5° to $81.5^{\circ}\text{C}.$; β -*helepinolic acid* ($\text{C}_{18}\text{H}_{28}\text{O}_4$), melting at 80.5° to $82^{\circ}\text{C}.$, and *heleponic acid* ($\text{C}_{18}\text{H}_{28}\text{O}_2$), in well-formed crystals, melting at 156° to $157^{\circ}\text{C}.$ The original oleoresin had the acid val., 180.75 to 182.74, and the sapon. val., 196.5 to 199.3.—Pharm. Journ. and Pharmacist, Dec. 21, 1912, 782; from Journ. de Pharm. et Chim., 1912, 6, 491 and 497.

Pinus Cambogiana—Chemical Examination of the Olcoresin.—

A. Wichmann examined a small amount of this substance which came from French-Farther-India, and obtained the following constituents:

1. *Volatile Oil* (20%) of density 0.892 and refractive index at 21°, 1.485. It smells like oil of turpentine and has aromatic burning taste.

2. *Cambopinenic Acid* $C_{11}H_{18}O_2$ (14%), white, non-crystalline, m. p. 70-78°.

3. *Cambopinonic Acid* $C_{16}H_{24}O_2$ (58%), yellow-white granular powder, m. p. 65-71°.

4. *Camboresene* (4%), bright yellow sticky mass obtained in quantity too small to permit thorough study.—Arch. d. Pharm., 250 (1912), No. 6, 472. (H. V. A.)

Copals—*Constituents of South American Varieties*.—Continuing the work of Tschirch and his students on various plant secretions, S. Machenbaum reports on his examination of Brazil copal and Columbia copal, giving data as to melting point, solubility in various solvents, acid number and saponification number and products of destructive distillation. He has also isolated and examined the following constituents:

From Brazil Copal: (a) Brazil copalic acid (6%) $C_{24}H_{40}O_3$, m. p. 170°-175°, which forms an alcohol-insoluble lead salt; (b) Brazil copalolic acid (24%) $C_{22}H_{38}O_2$, m. p. 95°-100°, which forms an alcohol-insoluble lead salt; (c) α -Brazil-copalo-resene (4%), which was not obtained pure enough to analyze; (d) volatile oil (5%), distilling between 245° and 255°; (e) Brazil copalinic acid (17%) $C_{18}H_{30}O_2$, m. p. 180°-185°; (f) β -Brazil-copalo-resene (8%), which was not obtained pure enough to analyze, and (g) ash (4%), consisting of the silicates of sodium, calcium and potassium.

From Columbia Copal: (a) Columbia-copalic acid (4%) $C_{22}H_{40}O_3$, m. p. 145°-150°, which forms an alcohol-insoluble lead salt; (b) Columbia-copalolic acid (21%) $C_{22}H_{40}O_2$, m. p. 90°, also forming an alcohol-insoluble lead salt; (c) α -Columbia copal-resene (2%), not obtained pure enough to analyze; (d) volatile oil (12%), which distilled between 210° and 220°; (e) α -Columbia copalinic acid (10%) $C_{14}H_{24}O_2$, m. p. 180°, which forms an alcohol-insoluble lead salt; (f) β -Copalinic acid (20%) $C_9H_{20}O_3$, m. p. 190°; (g) β -Columbia copal-resene (3%), not pure enough to analyze, and (h) ash (2%), consisting of silicates of sodium and calcium.—Arch. d. Pharm., 250 (1912), No. 1, 6 and 13. (H. V. A.)

Fossil Copal from Guiana—Characters and Composition.—J. C. Essner has subjected the semi-hard fossil copal from Guiana to chemical examination. It occurs in whitish or yellowish transparent pieces with reddish spots, has a pleasant but feeble odor, and is easily powdered. The whiter outer layer is readily soluble in ether and in alkalies. It softens at 175° C., melts at 190° C., and at 230° C. it decomposes into yellowish oil, which solidifies on cooling. The resin is soluble in ether, chloroform, carbon bisulphide, and in most organic solvents. The colorless portion has the acid value, 118; sapon. val., 127; iodine val., 84.3. The yellow portion has the acid val., 125; sapon, val., 151; iodine val., 81.5. The sp. gr. of the copal is 1.089.—Pharm. Journ. and Pharmacist, Aug. 31, 1912, 295; from Annales. Chim. Analyt., 17 (1912), 166.

A—CNIMAL DRUGS AND PRODUCTS

Leeches—Method of Preservation.—While the demand for leeches (*Sanguisuga medicinalis*) is modernly comparatively rare, in some localities pharmacists are not infrequently called upon to supply them. Theissen therefore makes some timely suggestions respecting the method of preserving them in a healthy condition, which are so simple that they can be readily carried out without occasioning trouble and with the apparent probability of avoidance of loss. The vessel containing the leeches should be kept in a cool place, accessible to fresh air, and as remote as possible from the fumes of acids and the vapors and emanations of the drug store; nor will it suffice to place them in the cellar, however cool this may be. The animals themselves should never be touched until required for use, and then only the particular leech selected and with the hands previously well washed and wiped. The container of glass should be provided with a layer of peat-mold and a small amount of fresh water, and, the leeches having been introduced, it should be tied over with a double layer of well-washed gauze. In accordance with the weather (heat or storm), the water must be changed more or less often, but never by first removing the gauze covering—fresh water being allowed to flow through the gauze after removing the original water by tilting the vessel. Under this treatment certain algæ are formed upon the peat-mold, which do not interfere with the health of the animals and may possibly be beneficial to them. At all events under the treatment described the author has had no reason to complain of loss or inability to supply healthy leeches.—Pharm. Ztg., lvii (1912), No. 59, 596.

Insects—Resistance to the Influence of Formaldehyde, Prussic Acid, Chromic Acid, etc.—See *Formaldehyde*, under “Organic Chemistry.”

Ants—Medicinal Use.—Fr. Berger presents an interesting sketch of the history of ants in medicine from ancient times until today, particular reference being made to the present use of ants in “old wives medicine” in primitive districts. The article is accompanied by excellent bibliographical references.—Schweiz. Wschr. f. Chem. u. Pharm., 1 (1912), Nos. 4 and 5, 51 and 72. (H. V. A.)

Diamphida Locusta—Use of the Larvæ for Arrow Poison.—According to Trommsdorff the bushmen of the Kalahari desert in Southwest Africa poison their arrows with the larvæ of a beetle, probably *Diamphidia locusta*. Extracts from these cause painful hemorrhagic œdema at the point of hypodermic injection when thus administered. But more rapid effects are produced by intramuscular injection. The chief effect is severe hemorrhagic nephritis; convulsions precede death, which results from stimulation of the respiratory center, followed by paralysis.—Pharm. Journ. and Pharmacist, June 15, 1912, 781; from Archiv. Schiff. u. Tropenhyg., 13, 617.

Beeswax—Refractive Index—L. Feldstem, in commenting upon the temperature at which the refractive index of beeswax is best taken, advocates the use of 75° C. as the best, as the wax is thoroughly melted at that temperature, and a clear reading obtained. He also advocates reporting the refractive index at 75° C. instead of at 40° C., as it is unreasonable to report the refractive index at a temperature at which it is an opaque solid, when the actual reading is made on the melted wax. Feldstem submits a table showing the refractive index of a number of samples of beeswax of known purity, at the temperature of 65° C., 75° C. and 85° C., also a table showing the influence a number of adulterants have on the refractive index of beeswax. The refractive index of pure beeswax ranges from 1.4398-1.4451 at 75° C., and a temperature correction of .00037 per degree C., is necessary when the reading is taken at other than 75° C.—Journ. Ind. and Eng. Chem., July, 1912, Vol. 4, p. 498. (L. A. B.)

Beeswax—Distinction According to Source.—Opportunities to examine various abnormal sorts of beeswax have led George Boehner to the conclusion that according to source, the beeswax may be divided into three groups:

1. Ordinary normal beeswax, in which the acid number has the relation of 1:3.6 or 4 to the ester number.

2. Certain beeswaxes, particularly those of African origin, which have the relation of acid value to ester value 1:3.

3. Indian beeswax, having the relation of acid value to ester value of 1:12. If such waxes are mixed with ordinary normal beeswax, they reduce the ester value (68 to 70), such as have now and then been observed in genuine waxes.—Pharm. Ztg., lvii (1912), No. 30, 303; from Ztschr. f. Öffentl. Chem., 1912, No. 5.

Beeswax and Carnauba Wax—Constants and New Method of Distinction.—A. Leijs has subjected beeswax and carnauba wax to comprehensive investigation by a new method, which he describes explicitly, together with the special apparatus constructed for the purpose of his experiments. The new method enables him to separate the paraffins, ceresins, and also the carnauba wax, and their subsequent characterization, and depends upon the discovery of the author that the higher alcohols, such as myrisyl alcohol, are soluble in a boiling mixture of fuming hydrochloric acid, whereas the hydrocarbons are not and congeal on the surface of the solution on cooling. The results obtained with two samples of beeswax and a sample of carnauba wax, are shown in the following:

	Beeswax		Carnauba Wax
	A	B	
Specific gravity at 15°.....	0.963	0.951	0.978
Acid number.....	19.9	19.0	7.8
Saponification value.....	98.6	92.0	87.0
Ether value.....	78.6	73.0	79.2
Relation of free to combined acid.....	3.95	3.84	10.1
Iodine number.....	9.	9.7	9.9
Saturated acids in 100.0 wax.....	41.34	35.7	47.1
Melting point of these acids.....	64°	52°-64°	75°
Neutralizing point of the saturated acids.....	155.6	181.3	78.5
Unsaturated acids (as oleic acid) in 100.0 wax.....	8.4	8.52	0.0
Alcohols in 100.0 wax.....	39.21	39.60	49.2
Melting points of these alcohols.....	77°	80°	81°
Relation of the alcohols to the acetates.....	1.082	1.087	1.089
Melting points of the acetates.....	57°	54°	69°
Acetyl number.....	122.2	127.6	122.0
Hydrocarbons in 100.0 wax.....	10.44	13.03	
Melting points of these hydrocarbons.....	56°	56°	
Iodine number of the same.....	13.8	15.6	

—Pharm. Ztg., lvii (1912), No. 57, 574-575; from Journ. de Pharm. et Chim., 1912, No. 12.

Honey—Microscopic Examination.—Dr. C. Fehلمان shows the value in food analysis of the microscopical examination of honey as every natural honey contains pollen. Indeed from the character of the pollen one can determine the geographic source of the honey and even the time of year when stored by the bee. Of course, natural honey diluted with glucose will still show the pollen; hence the plan has its limitations. Besides pollen grains, the sediment from diluted honey shows starch grains; when the bees (in early spring) are fed on meal and sugar, shows specks of ultramarine; when they have been fed on sugar, shows spores of fungi, when carelessly prepared. The paper closes with the kind of pollen found in natural honey obtained from different parts of Switzerland.—Schweiz. Wschr. f. Chem. u. Pharm., 1 (1912), No. 11, 149. (H. V. A.)

Honey—Important Factors in Examination.—Dr. J. Fiehe and Dr. Th. Stegmüller have made an experimental study of the various steps concerned in the examination and valuation of honey and point out the following as the more important factors that serve to establish its source and quality:

1. The accurate determination of dry residue is possible only if carried out by actual weighing; the indirect determination, depending on the density of the honey solution give only approximate values.

2. In view of the questionable presence of formic acid as a constituent, the acidity of honey should be expressed in terms of cubic centimeters of normal soda solution required for neutralization, using sensitive violet-blue litmus paper as indicator of free acid.

3. The determination of the alkalinity of the ash of honey may conveniently be combined with a simple acidimetric titration of the phosphates, the estimation of which is a valuable factor.

4. In sugar determination with Fehling's solution it is immaterial whether the copper is weighed as metal or as oxide.

5. Cane sugar must be determined by gravimetric methods, the polarization method giving only approximate values.

6. The method of Ley for the detection of invert sugar is not reliable. For this purpose the reaction of Fiehe, particularly when combined with the diastase test, has proven satisfactory.

7. Fiehe's reaction is also well adapted for the determination of starch syrup and starch sugar, being both simple and reliable.

8. The determination whether honey has been heated above 85° can be reliably effected by the aid of the diastase test.

9. The determination of precipitable albuminoids, as proposed by Lund, is of no practical value as a criterion of the quality of honey.—Pharm. Ztg., lvii (1912), 64, 644; from Arb. a. d. Kaiserl. Gesundheitsamt. 40 (1912), No. 3.

Honey—Detection of Technical Invert Sugar.—Gehe & Co. call attention to the value of Fiehe's reaction for distinguishing natural honey from honey adulterated with synthetic invert-sugar. If the residue of evaporation from an ethereal extraction of the honey (5+5) does not develop a red color with resorcin and hydrochloric acid, the sample is pure natural honey extracted from the comb without heating. The development of a rose-red, red or violet color, which disappears in the course of a few hours, indicates that the honey has been clarified by heating; the production of a red color, however, which remains 24 hours or more indicates that the sample is artificial honey or has been adulterated with technical invert sugar.—Pharm. Ztg., lvii (1912), No. 31, 310; from Gehe's Report, 1912.

Honey—Formic Acid not Uniformly a Constituent.—According to the studies of H. Fincke, formic acid is not uniformly a constituent of natural honey. While the largest number of honeys examined contained a volatile reducing acid, presumably formic acid, the quantity of this acid in general did not exceed a limit of 0.003 per cent., while some of the honeys contained no acid at all. It follows that all the conclusions based on the supposed presence of formic acid in honey are based on false premises and must be disregarded.—Pharm. Ztg., lvii (1912), No. 38, 382; from Ztschr. f. Unlers. d. Nahr. u. Genurism., 23, (1912), No. 6.

Frogs—Poisonous Secretion used as Arrow-Poison.—W. Casparis and A. Loewy state that in Columbia, the natives employ blow-tubes with darts made from the spines of a palm, poisoned with the secretion of the skin of a small frog. As it is important to have the poison in a fresh condition, these frogs are carried about by the hunter in a hollow bamboo. The skin is pricked with a pointed spine and the liquid which exudes used to poison the darts, just before use. It is stated that large animals, such as jaguars, apes, and deer, are quickly paralyzed when pierced with one of these, and are easily killed when in that condition. The flesh of animals thus killed is stated to be quite harmless when eaten. The authors find that the edible frog *Rana esculenta* also excretes from its skin a similar poison, when this is irritated by faradisation. An extract prepared from the skin also produces, in guinea-pigs, symptoms sim-

ilar to those following inoculation with the arrow poison.—Pharm. Journ. and Pharmacist, March 23, 1912, 387; from *Nouv. Remèdes*, 29 (1912), 64.

Cod-Liver Oil—Pharmacological and Bio-Chemical Characters.—In a comprehensive paper communicated to the Pharmaceutical Society, London, Dr. Owen T. Williams interestingly discusses the subject of cod-liver oil from the pharmacological and bio-chemical standpoint. He says that for a century no drug has withstood the test of clinical experience better than the well-known and household remedy, cod-liver oil. Yet, in the midst of the discussions of the modern methods of treating tuberculosis, this remedy which has stood the test of time, is apparently losing ground in favor of newer methods. The efficiency of the oil has been attributed to the almost infinitesimal quantities of iodine or phosphorus, or to peculiar bodies to which fanciful names have been given. The author however points out that an important difference between cod-liver oil and drugs which act in virtue of an active principle lies in the fact that cod-liver oil is in the nature of a food, and its activity is in a different sphere to that of drugs ordinarily so-called. The active principle of a drug enters into a combination with a body cell in such manner that it is loosely held and can be recovered from the cell, its activity results by an alteration of the chemical or physico-chemical reactions of the cell without yielding energy to it. Cod-liver oil, on the other hand, enters into direct and permanent combination with the cell, yielding energy to it, and thereby altering the whole of the cells' relations by becoming an integral part of the cell protoplasm. Dr. Williams believes that the activity of the oil is to be found in those constituents which can perform this rôle, and these are the fats themselves.

The fatty substances in the animal tissues contain compounds of both saturated and unsaturated fatty acids. There is evidence to show that the unsaturated fatty acids serve the immediate needs of energy production, and that the saturated acids are stored in the nature of a reserve. Results have shown that unsaturated acids are more easily absorbed than saturated acids, and cod-liver oil, containing unsaturated acids in great preponderance, is consequently easily absorbed; and not that alone, but it has a marked influence in aiding the absorption of other fats. Furthermore, experiments made by Dr. H. McLaw and the author have shown that in many cases the greater part of the fat obtained from the tissues is not real fat in the ordinary sense of the word, but to a great extent consists of complex combinations of fatty acids with glycerophos-

phates and a nitrogen-containing compound (lecithin ?)—the so-called phosphatides; and fat which is being made use of by the living cells seems to be represented to a great extent, if, indeed not altogether, by phosphatides. The phosphatides found by Dr. McLaw and the author in the tissue fats were however, not found in cod-liver oil in subsequent experiments of the author and Mr. G. E. Branch, from which it is inferred that, if they occur in cod-liver oil, they are split up, and the fatty portion only is yielded to the oil in the process of extraction. From observation, both in the laboratory and clinically, where the effect of the oil on metabolism was investigated, it is believed that the therapeutic effect of cod-liver oil is due to the amount of unsaturated fatty acid compounds it contains, and not to its impurities. Indeed, a consideration of the methods of preparation of the oils examined leads to the belief that the presence of small quantities of iodine, phosphorus, and various other bodies is due to decomposition.

It is thus seen that cod-liver oil is quite a different type of fat to any which occurs normally in food. It contains little if any phosphatide, is not, when prepared under proper conditions, a mixture of saturated and unsaturated fats, but is composed almost exclusively of unsaturated fats. Cases cited by the author show that the administration of cod-liver oil has an influence on metabolism in tuberculosis which is of a most beneficial character, and from this point of view alone its administration is of great value. Other observations show that the fatty acids of the oil can actually dissolve the waxy envelope which surrounds the tubercle bacillus, and that it is possible that this effect may take place in the body. It is of the utmost importance, however, that if the oil is to have a high degree of unsaturation, oxidation must be avoided in its preparation and storage. "Of the oils on the market, the forms which are prepared under conditions which prevent oxidation have the greater amount of unsaturated fatty acid compound to which the therapeutic effects can be attributed." "These oils prepared under these conditions have the least taste."—Pharm. Journ. and Pharmacist, Dec. 28, 1912, 806-809.

Rats—Necessity for Exterminating.—Rucker, W. C., discusses the necessity for rodent extermination in American seaports, and points out that the rodent is the twentieth-century anachronism. He is as archaic as the neolithic midden to which he is coeval, and yet today we tolerate him, permit him to devastate our storehouses and to act as the intermediary vehicle for the transference of the organisms of disease between his loathsome carcass and the body

of man. It has been necessary for plague to ravage the world many times before man has learned well the lesson that the rat and his confrères, the mouse and the ground-squirrel, are among the most deadly animals with which he has to deal.—J. Am. M. Assoc., 1912, v 59, pp. 243-244. (M. I. W.)

Horsehair—Detection of Artificial Color and Vegetable Fibres.—To detect artificial color of horsehair, heat with water, alcohol, ether, diluted hydrochloric acid or ammonia water. To detect vegetable fibres add sufficient concentrated sulphuric acid to cover a sample and set aside for six hours in a well-closed vessel. Horsehair is scarcely attacked, but vegetable fibre is quickly carbonized. Another test is to boil a sample with solution of potassium hydroxide, which quickly dissolves horsehair but does not attack vegetable fibre, except turning it brown.—Ph. Zhalle, 1912, No. 24, 672 (O. R.)

INORGANIC CHEMISTRY

GENERAL SUBJECTS

Transmutation of Elements—Present Status.—Briefly reviewing the endeavors made to prove the possible transmutation of the elements, the "Pharmaceutische Zeitung" (Sept. 18, 1912) describes the present status of these investigations as follows: In 1907 Ramsay and Cameron made the surprising statement that they had succeeded in the conversion of copper into lithium. This statement was shortly thereafter proven by Madam Currie to be erroneous. It is now again asserted that these two scientists have succeeded in the transmutation of elements. Distilled water was placed in contact with a small quantity of "Niton," with the result that beside the expected liberation of oxygen and hydrogen, "Helium" was also produced, and, furthermore, the lines of "Neon" were also recognized in the resulting gaseous mixture. These results are regarded by Ramsay and Cameron as indisputable proof of the transmutation of an element. Inasmuch, however, as these experiments were made with the element "Niton," but recently discovered by Ramsay and subjected to limited study only, the claim of the successful transmutation of an element should not be unconditionally accepted.—Pharm. Ztg., lvii (1912), No. 75, 757.

A System of Qualitative Analysis for the Common Elements.—This article forms a continuation of a series of articles under the same main title, by A. A. Noyes, published in the Journal American

Chemical Society, this particular paper being "Part V—Detection of the Acidic Constituents."

Owing to the nature of the subject matter, the paper is not abstractable.—Journ. Am. Chem. Soc., May, 1912, Vol. 34, p. 609. (L. A. B.)

Indicators of the G. P. V.—Review of their Chemistry and Uses.—Engen Nickel contributes a review of the chemical characters and uses of the indicators directed in the G. P. V. These are considered according to origin under three heads, as vegetable, inorganic-chemical, and organic-chemical compounds, embracing under the first head: litmus, starch, and haematoxylin, under the second: potassium chromate, ferri ammonium sulphate, and potassium iodide; and under the third: phenolphthalein, iodeosin, and dimethylaminoazobenzol. The details must be consulted in the original, in Pharm. Ztg., lvii (1912), No. 69, 696-697.

OXYGEN.

Oxygen—Action.—An editorial (J. Am. M. Assoc., 1912, v 59, p. 807), points out that while oxygen therapy has in some way or another entered into the experience of almost every physician, few have a real conception of the actual rôle which the gas plays. Some recently reported observations by Benedict and Higgins have established the fact that the inhalation of oxygen lowers the pulse rate. After the oxygen is stopped the pulse-rate at once increases and almost regains the original rate in fifteen minutes. (M. I. W.)

Oxygen—Inhalation.—An editorial (J. Am. M. Assoc., 1912, v 59, pp. 1546-1547) discusses oxygen inhalation and oxygen pneumonia, and calls attention to the work of Adams (Biochem. Jour., 1912, vi, 307), who concludes that oxygen in any percentage at atmosphere pressure can be inhaled for short periods without ill effects. At percentages below 70 it can be inhaled for prolonged periods without giving rise to any symptom or pathologic sign; but when the content rises above this, the use of oxygen is attended with serious risk of causing an irritative pneumonia, and, if persisted in, produces death. (M. I. W.)

HYDROGEN.

Hydrogen—Constant-Pressure Generator.—In the course of some work it became necessary to generate pure hydrogen gas at a steady rate of 10 liters per hour. For this purpose, S. H. Collins has succeeded in devising a water-sealed constant-pressure generator which

has proven satisfactory and of which he gives a description, accompanied by a drawing exhibiting the details of its construction, in *Chem. News*, May 10, 1912, 217.

Water—Determination of Free Carbonic Acid.—Dr. H. Noll finds Trillich's method for the determination of free carbonic acid in waters reliable when they do not contain bicarbonates, or when the CO_2 content is so great as to produce appreciable quantities of bicarbonates during the process of titration. In the case of waters containing an abundance of bicarbonates, the values ascertained are misleading, unless a phenolphthlein solution of the correct strength and quantity is employed.—*Pharm. Ztg.*, lvii (1912), No. 47, 472; from *Ztschr. f. Angew. Chem.*, 1912, No. 20.

Water—Decomposition by Magnesium at Ordinary Temperatures.—Arthur W. Knapp observes that when magnesium is mixed with water no reaction is observed at ordinary temperatures, although the formation of magnesium hydroxide and the liberation of hydrogen is an exothermic reaction. This is commonly explained by saying that the film of hydroxide first formed covers the metal and retards further action. The author finds, however, if magnesium powder be added to ten times its weight of water, and then to this mixture such an amount of palladious chloride as contains about one-hundredth part of the weight of magnesium used, a brisk evolution of hydrogen occurs. The temperature rises rapidly until the water boils and considerable white hydroxide is formed. The reaction is explained by the initial reduction of palladious chloride to metallic palladium which acts as a catalytic agent. The small amount of magnesium chloride formed possibly also accelerates the reaction at first by dissolving the hydroxide; but the palladium, which has accelerated the *decomposition* of the water, soon accelerates its *formation*, for it is warm, and some of it rising on the bubble-films, which separate the hydrogen from the air, causes the hydrogen to ignite spontaneously.—*Chem News*, May 31, 1912, 253.

Water—Detection of Iron.—O. Mayer recommends the following simple method for the detection of iron in water, which is capable of detecting 0.01 Mgm. in a liter: to 100 Cc. of the water at least 10-20 drops of Bromine-Hydrochloric acid (1 p. bromine to 500 p. by volume of conc. HCl) are added, in a test tube, followed by 10 Cc. of a mixture of equal volumes of ethylether and amyl-alcohol. Mixture is effected without shaking, by frequently inverting the well closed test tube, which is then set aside; the amyl-alcohol rapidly collects on the surface of the water (which retains

the ethylether) and remains colorless if the water is free from iron, but assumes a red color of greater or less intensity in the degree of the amount of iron present, a rose color being imparted to the amyl-alcohol by as little as 0.01 milligram of iron in 1000 Cc. of the water.—Pharm. Ztg., lvii (1912), No. 478; from Chem. Ztg.

Waters—The Relation of Interstate to the Spread of Disease.—McLaughlin, Allan J., discusses the relation of interstate waters to the spread of typhoid, and points out that while the average death rates from typhoid fever per hundred thousand of population in European cities was 5.30 in 1909 and 4.50 in 1910, there is an aggregate total of 25 deaths per hundred thousand annually in the larger cities of the United States. He believes that more attention should be paid to the securing of pure drinking-water and to such treatment of sewage as is found necessary to prevent the spread of disease.—J. Am. M. Assoc., 1912, v 59, pp. 1425-1429. (M. I. W.)

Dead Sea Water—Analysis.—Previously recorded analyses of the water of the Dead Sea have differed considerably from one another. A. Friedmann remarks that one of the principal reasons for the differences may have been that the water was only analyzed after long delay in transport and without exact records of the depths, temperature, place, etc., at which the samples were taken. Samples taken in 1911 and tested in certain respects on the spot, the full analyses being made very shortly afterwards, gave the following results:

	From depth of 0.5 metre	From depth of 3 metres
Specific gravity at 15°.....	1.1241	1.1336
Total solids, dried at 140°.....	23.8500	21.1309
Sodium chloride.....	7.8550	7.9325
Potassium chloride.....	1.5208	1.4318
Calcium chloride.....	3.6800	3.6903
Magnesium chloride.....	10.0299	10.3125
Sodium bromide.....	0.5200	0.5212
Calcium sulphate.....	0.1460	0.1472
Calcium carbonate, iron, organic matter.....	traces	traces

The temperature of both samples at the time of taking was 27°; the reaction was alkaline, and lead acetate paper placed at the mouth of a vessel containing the water was darkened.—Pharm. Journ. and Pharmacist, May 4, 1912, 571; from Chem. Ztg., Feb. 6, 1912, 147.

Water and Hydrogen Dioxide—Consideration as "Acids."—Dr. J. Sperber presents his views on the subject of water and hydrogen dioxide considered as "acids." This includes the idea that metallic hydroxides are primary salts (e. g. NaHO), while the metallic oxides

are secondary salts (e. g. Na_2O). He calls such "salts" *aquates*, while corresponding metallic peroxides, he calls *hyperaquates*. This, according to his reasoning, eliminates bases from chemical nomenclature and he also seems to be of the opinion that the word "acid" will also disappear by considering all acids as salts of the "metal" hydrogen. The question of alkalinity and acidity he disposes of by calling attention to the fact that some normal salts (e. g. Na_2CO_3) are distinctly alkaline and that alkalinity and acidity are, therefore, functions of the individual ions rather than characteristics of two classes of compounds. He promises experimental work that will prove his contention—Schweiz. Wschr. f. Chem. u. Pharm. 1 (1912), No. 50. (H. V. A.)

Hydrogen Peroxide—History, etc.—Professor C. B. Jordan tells an interesting story of Hydrogen Peroxide, accompanying his paper with charts showing the effect of varying conditions upon the permanency of its solutions and particularly calling attention to the fact that bottles stoppered with cotton seem to conserve strength of this preparation better than cork-stoppered bottles. The charts demonstrate the necessity of keeping solutions of H_2O_2 from exposure to light. He calls attention to an excess of acid in many commercial samples.—Proc. Ind. Phar. Assoc., 1912, 58-65. (E. C. M.)

Hydrogen Peroxide—Hydrolyzing Action on Starch.—C. Gerber has demonstrated before the "Société de Biologie" that hydrogen peroxide acts as a powerful hydrolyzant on starch paste, comparable to diastase. Like that ferment, it produces maltose as a final product, and not glucose, such as is formed by the action of acids.—Pharm. Journ. and Pharmacist, Sept. 21, 1912, 371; from Jour. de Pharm. et. Chim., 1912, 6, 238.

Hydrogen Dioxide.—Strength of its solutions should be stated by percentage of pure H_2O_2 by weight, not by volume. In order to avoid the uncertainty of actual strength of hydrogen dioxide solutions, due to the variable statements, commercially, of their strength by volume and by weight percentages. Dr. Th. Fischer advises that the prescriber should base his prescription invariably on the declared and actual content of pure hydrogen dioxide (H_2O_2) by weight in the solution available and to direct its dilution to the required percentage by weight, leaving out of consideration any statement regarding the volume percentage that may be made by the purveyor.—Pharm. Ztg., lvii (1912), No. 55, 554; from Münch. Med. Wschr., 1912, No. 20.

CHLORINE.

Halogens—Precautions in Determinations in Organic Substances.—A contributor in "Ztschr. d. allegm. Österr. Ap.-Ver." (1912, No. 21) directs attention to possible loss during the soda-nitre melting process, and advises certain precautions, describing a practical method for conducting the process so as to avoid the possibility of loss and consequent error. The details of the method must be consulted in the original.—Pharm. Ztg., lvii (1912), No. 47, 472.

Halogen Acids—Qualitative and Quantitative Estimation in Presence of Hydrocyanic Acid.—K. Polstorff and H. Meyer describe a method for the qualitative determination of the halogen-hydrogen acids in the presence of cyanhydric acid. Having determined the presence of HCN in the solution of halogen acids (or their salts), which should not be too concentrated, the acid is made alkaline with halogen-free solution of potassium hydroxide and formaldehyde solution is added with continuous rotation of the container until its odor is distinctly manifested. The solution is then acidulated with nitric acid and silver nitrate solution is added. If a white, curdy precipitate forms, which is soluble in ammonium hydroxide, the presence of hydrochloric acid is indicated. The quantitative method, which is given in some detail, is based upon the reactions described.—Pharm. Ztg., lvii (1912), No. 75, 758; from Ztschr. f. analyt. Chem., 1912, No. 10 and 11.

Hydrochloric Acid—Industrial Production from Chlorine.—Under former conditions of manufacture chlorine was produced from hydrochloric acid. O. Nagel now calls attention to the fact that in America these conditions are reversed, hydrochloric acid being now prepared from chlorine, which has become a cheap by-product in the large production of caustic soda by electrolysis. If chlorine and steam are heated with excess of carbon to about 1000° C., the reaction which occurs is represented by the equation, $\text{Cl}_2 + \text{H}_2\text{O} + \text{C} = 2\text{HCl} + \text{CO}$. This method of making hydrochloric acid was first recommended in 1894; but the market did not then permit of its use, and the details of the proposed method of working made it costly and inconvenient. It is now satisfactorily carried out by using coke as the source of carbon; this is heated in a vertical box in a blast of air, and when the temperature is high enough the blast is shut off, and an intimate mixture of chlorine and steam passed through; after five minutes this is stopped, and the temperature again raised by the air blast for one minute, when the gas mixture is again passed, and so on. The hydrochloric acid is absorbed

by passing the evolved gases through water, the remainder being fairly pure carbon monoxide; this can be used for various technical purposes, or as fuel.—Pharm. Journ. and Pharmacist, March 30, 1912, 421; from Chem. Ztg., January 13, 1912, 54.

Chlorous Acid—Preparation and Decomposition.—Lasègue finds that a pure aqueous solution of chlorous acid can be obtained by the action of sulphuric acid on barium chlorite. When left to itself it readily decomposes, and if the decomposed solution is neutralized with baryta, the chlorine is found divided into four portions—as chlorate, chlorite, hypochlorite, and chloride of barium.—Chem. News, Aug. 30, 1912, 108; from Compt. rend., 155 (1912), No. 2.

Chlorous Acid—Gravimetric Method of Determination.—According to G. Lasègue, chlorous acid can be determined by precipitating its lead salt as follows: The chlorite in solution, which must not contain free alkali, is precipitated with an excess of a solution of lead nitrate. After shaking, 6 volumes of alcohol at 85° are added, and the mixture is allowed to stand for an hour. It is then filtered through a filter which has been weighed after drying *in vacuo*, and the precipitate is then dried *in vacuo* over sulphuric acid and weighed. If the solution under examination contains free alkali, it is treated with magnesium nitrate which forms a precipitate of magnesia and nitrate of the alkali; the estimation is then conducted as above mentioned. The method can be used to determine chlorous acid in presence of all other oxygen acids, and even of small quantities of hydrochloric acid.—Chem. News, Dec. 27, 1912, 318; from Bull. Soc. Chim. de France, xi-xii (1912), No. 16-17.

Calcium Hypochlorite.—Stokes and Hachtel, in a report on some results of the treatment of the Baltimore drinking-water by calcium hypochlorite, one part of available chlorine per million parts of water, point out that the results show that the hypochlorite treatment produced a marked diminution of the bacterial content of the treated water until the last two or three months, when variable results were obtained owing to the after-growth of resistant, spore-bearing organisms. The treatment has produced an invariable reduction in the percentage of positive tests for the colon bacillus.—J. Am. M. Assoc., 1912, v. 59, pp. 1505-1509. (M. I. W.)

Perchlorates—Preparation and Properties.—H. Goldblum and F. Terlikowski have prepared and described the perchlorates of nickel, cobalt, and didymium, which can all be obtained by the action of perchloric acid on their respective carbonates, while perchlorate of chromium is obtained by dissolving the hydrate in the acid.

Nickel Perchlorate is the neutral salt of divalent nickel. It crystallizes with five molecules of water, and at 103° it decomposes, losing HClO_4 , yielding basic salts, while in solution it undergoes hydrolytic decomposition.

Cobalt Perchlorate is very similar to the nickel salt, but it does not decompose when heated above 103° , nor does it undergo hydrolysis in solution.

Didymium Perchlorate is distinguished from the other salts by being less soluble in absolute alcohol. Chem. News, March 15, 1912, 132; from Bull. Soc. Chim. de France, xi-xii, 1912, No. 3.

Perchlorates—A Quantitative Determination.—A. B. Lamb and J. W. Marden (N. Y. Univ.) state that perchlorates may be rapidly and accurately determined by heating the perchlorate in a glass test tube (Jena) fitted with two plugs of asbestos wool, each 15 Mm. thick and placed about 45 Mm. apart. The tube is clamped in a nearly horizontal position and the sample heated gently at first until the effervescence, due to the escape of oxygen, ceases, after which the chloride is thoroughly fused. The asbestos plugs prevent the loss of chloride by volatilization. After cooling, the content of the tube is transferred to a filter and thoroughly washed with warm water, the chloride being determined in the filtrate as silver chloride. The method gave results varying less than 0.02 per cent. from the calculated values.—J. Am. Chem. Soc., June, 1912, Vol. 34, p. 812. (L. A. B.)

BROMINE.

Perbromic Acid—Evidence of Non-Existence.—F. W. Robertson observes that while the original statement of Kammerer that perbromic acid could be obtained by the action of bromine on perchloric acid was at first confirmed, it was afterwards refuted by Muir (1876), and since then by Wolfram (1879), McIvor (1887), Cook (1894), Tanatar (1899), and Müller and Friedberg (1902). During the last ten years the author has also been interested in this problem, and has endeavored to prepare salts of perbromic acid by several methods, which he briefly outlines; but he, like the others since the original announcement of its existence, has also failed of success. It seems therefore that it must be concluded that perbromic acid and its salts are not capable of existence.—Chem. News, Aug. 2, 1912, 50.

IODINE.

Iodine—Compound with the Elements of the Nitrogen Group.—As the result of their researches, F. M. Jaeger and H. J. Doornbosch state finally that an iodide of *nitrogen* having the formula NI_3 cannot be isolated. Two iodides of *phosphorus* are known, the di-iodide, P_2I_4 , m. p. 124° , and the tri-iodide, PI_3 . Of *arsenic* one iodide only, AsI_3 , is definitely known, the existence of a di-iodide, As_2I_4 , having been regarded as doubtful; but, although the authors have failed to obtain it in a pure state, they consider that it undoubtedly does exist in the melt obtained when arsenic and iodine are fused together. By cooling a melt of *antimony* and iodine only one compound, SbI_3 , melting at 170.8° , is formed.—Pharm. Journ. and Pharmacist, Aug. 10, 1912, 201; from Ztschr., anorg. Chem. 75 (1912), 261.

Iodine—Determination in Iodides.—According to V. Auger iodine in iodides, and especially in sea-weeds, can very readily be estimated by oxidizing the iodide with potassium permanganate and determining the iodate formed. The solution containing the iodide is made alkaline with soda, a concentrated solution of permanganate is added, and the liquid is heated, acidulated with acetic acid, and treated with H_2O_2 till the MnO_2 disappears. Some dilute permanganate is then added, and finally H_2O_2 till the brown coloration is destroyed; whereupon 1 Gm. of KI and 5 Cc. of HCl are added, and the iodine formed is determined by means of hyposulphite in the usual manner.—Chem. News, Aug. 9, 1912, 72; from Bull. Soc. Chim. de France, xi-xii (1912), No. 12.

Iodides—Volumetric Estimation.—The assay process of Rupp and Schirmer for estimation of ferrous iodide by use of ferric chloride as oxidizing agent, suggested to W. Schirmer similar assays for the alkaline iodides. Potassium iodide can be assayed by dissolving 0.4 Gm. KI in 20 Cc. water, adding 5 Gm. solution ferric chloride (of German Pharmacopœia), letting stand an hour, then diluting with 100 Cc. water, then adding 10 Cc. 25% phosphoric acid, followed by 0.5 Gm. KI (to dissolve separated iodine) and finally titrating with tenth-normal thiosulphate. Iodine can also be liberated from the iodide with sodium nitrite if precautions are taken to remove the excess of N_2O_3 produced by the reaction. Urea accomplishes this aim, the proper proportion being KI 0.5 Gm., urea 1 Gm. and nitrite 0.1 Gm. Potassium iodate serves a similar purpose provided borax is added to neutralize excess of iodic acid. Details of this assay

are given in the original paper.—Arch. d. Pharm., 250 (1912), No 6, 448. (H. V. A.)

Iodides—Determination by Direct Titration.—J. W. Turrentine states that iodides may be titrated direct in the presence of bromides or chlorides by the use of standard potassium permanganate, the liberated iodine being removed from the solution by means of carbon tetra-chloride, the end point being when the pink color of the potassium permanganate persisted for one minute.—Journ. Ind. & Eng. Chem., June, 1912, Vol. 4, p. 435. (L. A. B.)

Iodides—Effects.—Capps, Joseph A., discusses the use of iodides on the circulation and blood vessels in arterio-sclerosis. He reviews the several theories that have been propounded in connection with the action of iodides, and concludes that iodides in therapeutic doses are not active vasodilators and when long continued do not materially effect blood-pressure. They probably owe their beneficial influence in syphilitic arteriosclerosis to the absorption of the cellular exudate in the arteries.—J. Am. M. Assoc., 1912, v, 59, pp. 1350-1352. (M. I. W.)

Potassium Iodide—Reaction with Mercuric Cyanide.—A. de Bournville finds that an aqueous solution of mercuric cyanide treated with an aqueous solution of potassium iodide gives, in sufficient concentration, a white precipitate of crystalline spangles. This fact is rather surprising in view of the fact that mercuric chloride treated under the same conditions with potassium iodide gives a red precipitate of mercuric iodide: $\text{HgCl}_2 + 2\text{KI} = \text{HgI}_2 + 2\text{KCl}$. It might be expected that with mercuric cyanide the reaction would take place according to the equation $\text{Hg}(\text{CN})_2 + 2\text{KI} = \text{HgI}_2 + 2\text{KCN}$, but it does not. The author prepared the white compound by adding a 10 per cent. aqueous solution of potassium iodide to a solution of mercuric cyanide in alcohol. The precipitate was washed thoroughly with alcohol of the same strength, then once with distilled water, and then dried in an oven at 100° . The salt occurs in beautiful white, pearly, crystalline spangles, of an unctuous feel; soluble in twelve parts of water at 15° , in two parts of boiling water, slightly soluble in alcohol (60 per cent. w/w), nearly insoluble in alcohol (94 per cent. w/w). When heated to 150° it loses its pearly appearance; if heated cautiously to about 300° mercuric iodide sublimes; at a higher temperature it chars and liberates iodine, and finally leaves a complex residue of potash. The aqueous solution is not affected by the alkalies, but acids, even very weak, produce a red precipitate of mercuric iodide with disen-

gement of hydrocyanic acid. Analysis of the compound shows that its composition may be expressed by the formula, $\text{Hg}(\text{CN})_2$, HgI_2 , 2KCN , and the equation representing the reaction is accordingly— $2\text{Hg}(\text{CN})_2 + 2\text{KI} = \text{Hg}(\text{CN})_2, \text{HgI}_2, 2\text{KCN}$. A similar compound has been prepared with potassium bromide, whose physical and chemical properties, other things being equal, are the same as those of the salt referred to. The corresponding sodium salts have likewise been prepared, which differ chiefly in their greater solubility.—Pharm. Journ. and Pharmacist, May 18, 1912, 647; from Ann. de Pharm., Feb., 1912, 49.

Pure Iodic Acid—Preparation.—Maurice Niclaux observes that the determination of carbon monoxide by means of iodic acid, depending on the liberation of iodine, gives accurate results only when the iodic acid is pure. Stas's method of preparing iodic acid is very tedious, and gives a poor yield, but the author has found that the oxidation of iodine with nitric acid presents no difficulty, and gives good results if the nitric acid employed is of the right concentration, viz., sp. gr. 1.515 to 1.520.—Chem News, June 14, 1912, 287; from Compt. rend., 154 (1912), No. 18.

Iodic Acid—Preparation for Carbonic Monoxide Determinations.—M. Niclaux recommends the following modification of Stas's process for the preparation of iodic acid, suitable for the determination of carbon monoxide, the latter depending upon its oxidation with iodic acid, an equivalent amount of iodine being set free: 15 Gm. of powdered resublimed iodine are added gradually to 70 Cc. of fuming nitric acid (sp. gr. 1.515 to 1.52) contained in a 150 Cc. flask, and heated on the water-bath to 70° - 73° ; the temperature is raised slowly to 80° - 85° , and the heating continued thirty to forty-five minutes. The color disappears and a heavy white precipitate of iodic acid is formed, which is purified by repeated crystallization from water, the yield by this modification being 84.2 per cent. The inferior yield (18%) by the original method of Stas is due to the use of weaker nitric acid.—Pharm. Journ. and Pharmacist, Aug. 17, 1912, 233; from Compt. rend., 154 (1912), 1166.

Iodic Acid—Detection in Nitric Acid.—G. Deniges detects iodic acid in nitric acid, as follows: The solution is made alkaline with ammonia and filtered if necessary. A small quantity of a 1 to 2 per cent. solution of silver nitrate is then added, and a little ordinary zinc. In the presence of iodic acid a white turbidity due to colloidal silver iodide appears on shaking.—Pharm. Journ. and Pharmacist, Aug. 3, 1912, 159; from Bull. de Pharm. du Sud-Est., 1912, 5, 244.

FLUORINE.

Fluorine—Detection and Determination in Waters.—When very small quantities of fluorine have to be determined in an aqueous liquid, such as a potable or mineral water, Armand Gautier and Paul Clausmann recommend that the solution be first made slightly alkaline, crystallized sodium chloride added, and then a slight excess of barium chloride. The liquid is then evaporated to dryness, the residue is taken up in the cold with just enough water to dissolve the soluble salts, an equal volume of alcohol at 96° is added, and the precipitate is washed by centrifugation with alcohol at 65°. The fluorine is then separated from the residue by heating it with sulphuric acid in a special crucible made of gold and hermetically closed, and condensing the fluorine in pure potash.—Chem. News, July 26, 1912, 48; from Compt. rend., 154 (1912), No. 23.

Fluorine—Control of the New Method of Determination.—Gautier and Clausmann have made a number of control experiments for their new method of determining fluorine, by dividing into two equal parts the substance in which the fluorine has been determined, adding to water a known weight of this substance, and ascertaining whether the weight of the fluorine added may be found by difference. The results were always quite satisfactory. Small quantities of fluorine can be detected by converting them into barium fluoride, free from silica, adding pure dilute sulphuric acid, and gently heating, the dish being covered by a glass disc previously varnished, and having a circular mark traced on it. The etching effect of the HF generated is easily visible to the naked eye.—Chem. News, Aug. 23, 1912, 95; from Compt. rend., 154 (1912), No. 26.

Fluoride Salts—Antidote.—Professor E. H. LaPierre calls attention to the dangers pertaining to the use of fluoride of sodium in Roach and Ant Destroyers and to the improper selection of lime water as an antidote for cases of poisoning from fluoride salts, and suggests in place of lime water to use milk of lime.—Proc. Mass. Pharm. Assoc., 1912, p. 38. (E. C. M.)

HELIUM.

Helium—Occurrence in Coal-Mine Gases.—C. Moureu and A. Lepage state that all samples of coal-mine gases examined by them have contained the rarer gases. The ratio of helium to nitrogen is much higher in them than in atmospheric air. In the gas from Mons, which is the richest of all in helium, this proportion reaches

13 per cent. of the nitrogen. None of the samples examined contained any appreciable quantity of radium emanation.—Pharm. Journ. and Pharmacist, Jan. 27, 1912; from Compt. rend., 153, 847

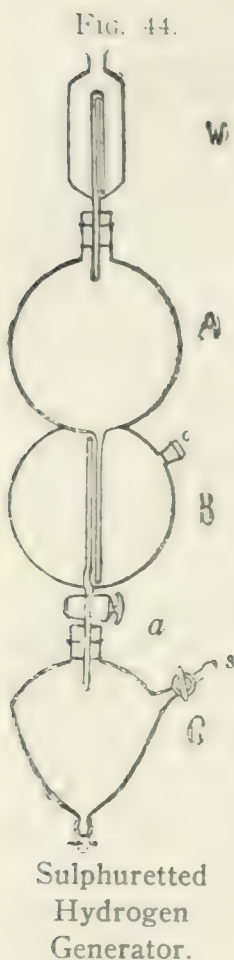
SULPHUR.

Free Sulphur—Rapid Volumetric Method of Estimation.—C. Davis and J. L. Foucar report the results of a method devised by Mr. Davis with the view of the rapid estimation of free sulphur in spent oxide, more especially that containing small quantities of organic matter soluble in the usual organic solvents. In the estimation of sulphur in the latter material, too high results are obviously given by the extraction test, and an oxidation test is somewhat tedious. The method proposed is to treat the finely powdered and dried material with a solution of sodium cyanide in absolute alcohol, the resulting sulphocyanide being titrated in the usual way. The results obtained are quite sufficiently accurate for commercial purposes.—Pharm. Journ. and Pharmacist, Jan. 13, 1912, 39.

Sulphur—Action on Vegetation.—E. Boullanger finds that flowers of sulphur, when added in minute quantity to the soil, has a remarkably favorable influence on the growth of carrots, haricot beans, celery, lettuce, potatoes, spinach, onions, and all other crops. The proportion used for experiments in pots was only 0.70 Gm. of sulphur for 30 kilos of earth. The result was even more marked when manure was added as well as sulphur. When sterilized soil was employed the addition of sulphur appeared to have but little influence in increasing the crop. It appears, therefore, that the favorable action of sulphur is indirect. Probably it modifies the bacterial flora of the soil and prevents the development of certain organisms. The subject is being investigated further.—Pharm. Journ. and Pharmacist, —June 15, 1912, 781; from Compt. rend., 154 (1912), 369.

Sulphuretted Hydrogen—Substitution of Alkali Sulphides in Analytical Operations.—The inconvenience occasioned by the use of sulphuretted hydrogen in analytical operations has led to the search for methods that shall obviate the necessity for its direct use as such. Hans Trapp has now succeeded in devising a method which has stood the test of rigid experimentation, in which, under specific instruction, the analysis is carried out by substituting ammonium sulphide (or other alkali sulphides) for hydrogen sulphide with identical results. The details of the method must be consulted in the original paper.—Pharm. Ztg., lvii (1912), No. 56, 563; from Ztschr. f. Analyt. Chem., 1912, No. 7 and 8.

Sulphuretted Hydrogen Generator—Modification of Ostwald's Apparatus.—H. Kapeller, Vienna, supplies a modified form of Ostwald's sulphuretted hydrogen apparatus, shown by Fig. 44, which



commends itself by its simplicity, the different parts being united by means of rubber stoppers. It consists of a semi-cone shaped generator, *G*, provided with a ground glass cock, *k*, beneath, and a gas-delivery tube, with cock, *s*, laterally near the top; this is surmounted by two globular acid-reservoirs, *A* and *B*, a ground-glass cock being interposed between *B* and *G* to regulate the inflow of acid (HCl) into the generator containing ferrous sulphate on a layer of glass wool, while *A* is surmounted by an absorption tube, *W*, containing solution of an iron salt for the purpose of absorbing any HS that may reach *A* in case too much acid is allowed to flow into *G* and the reaction becomes too violent. The lateral tubulure, *C*, being closed with a rubber stopper, and the large cock, *a*, open, the reservoir, *B*, is filled with acid through *A* the cock *a* is now closed and reservoir *A* is half-filled with acid. The absorption tube, *W*, being then adjusted, the cock, *s*, is opened and acid allowed to flow into the generator by opening the cock *a*, the inflow being regulated so as to produce the required flow of gas. On closing the cock, *s*, the pressure of the gas automatically

forces the acid from *B* into *A*, and the reaction ceases. This may also be accomplished by withdrawing the acid by opening the cock *k* after closing cock *a*.—*Pharm. Ztg.*, lvii (1912), No. 76, 768.

Hydrogen Sulphide Apparatus—Combination Generator and Washer.—A new form of sulphuretted hydrogen apparatus efficiently combining the generation and washing of the gas, whether required for continuous operation or in a frequently interrupted flow, is manufactured by Kob & Co., Stützenbach, Thuringia (Saxony). It consists of series of globular vessels, superimposed upon each other. The upper vessel is fitted with a thistle-funnel through a rubber stopper in the tubulure, for supplying acid from time to time as it is consumed, and is provided with a stoppered outflow tube passing through the smaller bulb into the larger one beneath, the joints being secured by grinding. The two lower vessels, which are in one piece, are each provided with two tubulures;

communication being effected by means of glass and rubber tubing, the glass tubing reaching to near the bottom of the central vessel, the capacity of which is about 1 liter, while that of the lower vessel is about 4 liters, the latter being provided with a stoppered outflow tube for withdrawing the expended acid. The whole is suspended in an iron tripod. In use the central vessel is about one-half filled with water, ferrous sulphide is introduced into the lower vessel through the lateral tubulure, and this having been securely stoppered, the acid is allowed to flow in drop by drop, the generated gas being washed in its passage through the central vessel, from which

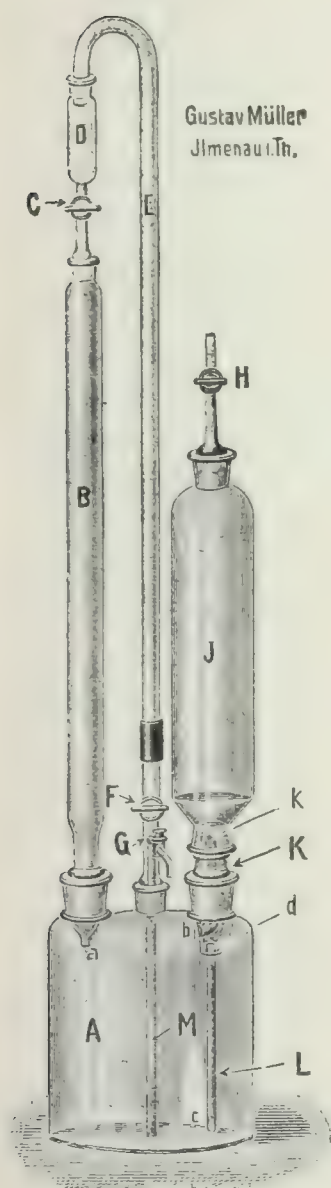
it is delivered through the lateral tubulure.

The new apparatus, which is protected by a German patent, is described and shown in illustration in *Pharm. Ztg.*, lvii (1912), No. 32, 321.

New Gas Generator—A Device for Economical and Convenient Manipulation.

—K. Bormann has constructed a new gas generator, shown by Fig. 45, which economically consumes the acid and conveniently permits the supplementary addition of acid and generating material. It consists of a three-necked acid reservoir, *A*; an acid-tube, *B*, surmounted by a funnel-tube, *D*, with intervening cock, *C*; a safety-tube, *E*, joined to a shorter tube, *M*, provided with two cocks, *F* and *G*, and reaching to the bottom of the acid reservoir, *A*; and the generator, *J*, joined to the reservoir at *K*, and bearing two tubes, the one, *b*, *k* admitting the fresh acid into *J*, the other, *L*, delivering the spent acid, which is specifically heavier than the fresh acid, through the holes *d* and *c* to the bottom of the reservoir. It is essential that the holes *d* and *c* be coincident in direction towards the opening *a* beneath the acid-tube *B*, which also faces inward. All joints, with the exception of the connection of the longer limb of the safety-tube with the shorter limb *M*, are of glass and ground to fit accurately. The reservoir *A* having previously been filled with acid, and the cock of the gas delivery

FIG. 45.



New Gas Generator.

previously been filled

tube, *H*, closed, acid is poured into the acid-tube *B*, cock *G* of the safety-tube being closed and cock *F* open, until *B* is nearly filled, when the connection at *D* is readjusted, cock *C* being open. If now cock *H* is carefully opened, gas is immediately generated and continues until the cock is again closed, whereupon the acid is forced back into the reservoir, and from this into the acid tube *B*, when further generation of gas ceases. The apparatus is supplied by Gustav Müller, Ilmenau, Thuringia.—*Pharm. Ztg.*, lvii (1912), No. 76, 768.

Potassa Sulphurata, *B. P.*—*Valuation*.—David Lloyd Howard and J. B. P. Harrison find the official test for the valuation of potassa sulphurata unsatisfactory and propose a new method, which is a modification of one devised by them for the determination of antimony in its sulphide preparation. By this new method a determination of the sulphur-content which is carried out quickly and with considerable accuracy, together with a supplementary test for the presence of sodium, affords almost all the information necessary to decide whether the potassa sulphurata has been prepared strictly in accordance with official requirements. The method of determination used depends on the oxidation of the sulphur compounds in sulphurated potash by fusion with sodium peroxide. About 20 grams of the commercial substance is quickly powdered in a mortar, passed through a 20-mesh fibre-sieve, and placed in a well-stoppered bottle. The test is then conducted as follows:

About 0.5 gram of substance is weighed out into a nickel crucible of about 60 Cc. capacity, and intimately mixed with 4 grams pure anhydrous sodium carbonate and 5 grams of sodium peroxide, the carbonate being added to prevent loss of substance from too rapid reaction. The oxidation is started by carefully heating the whole with a very small Bunsen-flame, and after the reaction has commenced the heat is increased sufficiently to bring the contents of the crucible into a homogeneous molten condition. There is no danger of deflagration, and with careful manipulation it is not necessary to cover the crucible. The mass is then allowed to cool, and the crucible is then placed in a beaker the bottom of which is just covered with distilled water. The mouth of the beaker is almost entirely covered with a clock-glass, and by means of a wash-bottle the crucible is filled with hot water, and the whole digested on the water-bath until effervescence has ceased and the melt has become detached from the crucible. The latter is then thoroughly washed and removed from the beaker, to the contents of which is added 25 Cc. concentrated hydrochloric acid (s. g. 1.16). The beaker is again

covered, and the contents heated until the solution is bright. After cooling, the solution is made up to a known volume (250 Cc.) and the sulphates, in an aliquot portion (50), determined in the usual manner. A blank experiment is carried out in order to allow for sulphur contained in the reagents.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1912, 475-480.

Sulphurous Acid—Presence in the Combustion Products of Coal Gas.—H. Wefers-Bellink observes that the rapid withering of flowers in rooms where much coal gas is burnt is due chiefly to the sulphuric acid which is produced from the sulphur in the coal from which the gas is made. In order to see if sulphurous acid is also produced, the products of combustion from a measured quantity of coal gas were led through three flasks containing 5% solution of potassium carbonate; the united solutions were then concentrated, acidified with sulphuric acid and distilled, and the distillate tested for sulphurous acid, which was found to be present in the amount of 0.002 Mgm. from one cubic meter of the gas.—Apoth. Ztg., xxvii (1912), 901; from Pharm. Weekbl., 1912, No. 43.

SELENIUM.

Selenium—Technical Objection to its Presence in Sulphur and Pyrites.—The "Zeitschr. f. Angew. Chemie" calls attention to the importance which attaches to the presence of selenium in sulphuric acid, since mineral oils and wax refined by the acid containing the impurity assume an incurable yellow color, and even minute traces of the element in the liquors of a sulphite cellulose factory may give rise to serious difficulties. A circumstantial process for the estimation of small quantities of selenium in sulphur and pyrites is therefore given, the details of which may be consulted in the abstract from Chem. Trade Journ., June 1, 1912, 598, printed in Pharm. Journ. and Pharmacist, July 13, 1912, 47.

TELLURIUM.

Tellurium Sulphide.—In a careful quantitative study of the compound formed when H_2S is allowed to act on solutions of H_2TeO_3 , W. O. Snelling states that the precipitate formed consists of tellurium and sulphur (one atom of tellurium to two atoms of sulphur), and that the entire quantity of sulphur can be extracted from the precipitate by means of CS_2 , if the solution has been allowed to stand for some time or has been warmed.

Tellurium sulphide (TeS) appears to be formed, but is decomposed at $0^\circ C.$ in about four hours or instantly if heated as is shown

by the fact that only half the sulphur may be extracted by CS_2 , at the moment of precipitation, and at a temperature of 0°C .

The author concludes "that a sulphide of tellurium having the formula of TeS exists; that it is formed by passing hydrogen sulphide gas into a solution of tellurous acid, according to the reaction $2\text{H}_2\text{S} + \text{H}_2\text{TeO}_3 = \text{TeS} + \text{S} + 3\text{H}_2\text{O}$, and that this compound decomposes at any temperature higher than 0° or in about four hours at that temperature."—J. Am. Chem. Soc., June, 1912, Vol. 34, p. 802. (L. A. B.)

NITROGEN.

Nitrogen—Method of Taking the Atomic Weight.—According to Eugène Wourtsel the conversion of nitric oxide into nitrogen peroxide may be employed to determine the atomic weight of nitrogen. A U-tube containing nitrogen peroxide is first weighed and then NO is introduced in it; a second weighing gives the weight of NO employed. A current of pure dry oxygen is then led into the cooled tube until all the nitrous anhydride is converted into peroxide. The slight excess of oxygen is eliminated by evacuation at -182° , and a final weighing gives the weight of the oxygen used. In the author's experiment, 14.007 was the mean of five determinations of the atomic weight of nitrogen by this method.—Chem. News, March 8, 1912, 119; from Compt. rend., 154 (1912), No. 3.

Nitrogen.—Fixation by aluminium and carbon, with production of *aluminous nitride*, which see under "Aluminium."

Nitrous Oxide and Oxygen Anesthesia.—Salzer, Moses, discusses nitrous oxide-oxygen anesthesia and reports a fatal case. He concludes that nitrous oxide-oxygen is not the safest anesthetic for the occasional anesthetist, and should be administered only by the expert.—J. Am. M. Assoc., 1912, v. 59, pp. 1872-1873. (M. I. W.)

Nitric Acid—Difficulty to Obtain a Commercial Product Free from Chlorine.—The technical production of chlorine-free nitric acid depends on the rectification of the commercial acid and rejecting the first portions of distillate, changing the receiver until the distillate, after dilution with water, fails to produce turbidity with silver nitrate solution. Dr. T. Bohrisch observes that when this simple process is conducted with care, there should be no difficulty for manufacturers to supply chlorine-free nitric acid; yet, he has found it very difficult to obtain nitric acid on the market, even from some of the most renowned German manufacturers, that responds to the official (G. P.) requirement for the absence of chlorine. The

absolute freedom of nitric acid from even traces of chlorine is particularly required when carrying out Sahli's reaction for the detection of chlorides in urine, which is modernly frequently depended on in urine examinations—the reagent consisting of 1/10 N. solution of silver nitrate in the official nitric acid and a certain proportion of solution of ferric sulphate.—Pharm. Ztg., lvii (1912), No. 19, 189.

PHOSPHORUS.

Alkali-Phosphides — Formation of New Combinations.—Louis Hackspill and Robert Bossnet find that when a mixture of an excess of alkali metal and phosphorus is heated *in vacuo* to 400°, a black substance is obtained, which slowly decomposes, losing metal, and finally gives a phosphide of the formula P_5M_2 . The composition of the phosphides of cæsium, rubidium, potassium, and sodium is the same, and all the compounds are yellow powders which are very readily decomposed in the air.—Chem. News, April 4, 1912, 168; from Compt. rend., 154 (1912), No. 4.

Thiophosphates and Thiophosphites—Conditions of Formation and Composition.—Fritz Ephraim and Rebecca Stein have prepared and give the composition of a number of thiophosphates and thiophosphites.

Potassium Tetrathiophosphate can be prepared by heating together 100 Gm. of crystallized potassium sulphide and 7.5 Gm. of phosphorus pentasulphide. Its formula is $K_3PS_4 \cdot H_2O$.

Ammonium Tetrathiophosphate is obtained by saturating ice-cold aqueous ammonia with H_2S and NH_3 , and adding phosphorus pentasulphide.

Barium Tetrathiophosphate, $Ba_3(PS_4)_2 \cdot Aq.$, and

Strontium Trithiophosphate, $Sr_3H_6(PS_3O)_4 \cdot Aq.$, are formed by the double decomposition of the corresponding hydroxides with sodium tetrathiophosphate.

Metallic sulphides in aqueous solution react with P_4S_3 and P_4S_7 . In the case of sodium sulphite the products have the formula $Na_3PS_3 \cdot Aq.$, and appear to differ only in the amounts of water they contain. The products appear to be thiosulphides. Barium sulphide with P_4S_7 yields

Barium Trithiophosphite, $Ba_3(PS_3)_2 \cdot Aq.$, and with P_4S_3 ,

Barium-Oxy-Thiophosphite, $Ba_3(PS_{5/6}O_{1/6})_2 \cdot 8H_2O$.

Ephraim also has prepared and describes

Diamido-thiophosphoric Acid. This can be prepared by warming the dichloride ($\text{POC}_6\text{H}_5\text{Cl}_2$) with sulphur, replacing the chlorine atoms by the amido groups by means of ammonia, and finally saponifying the phenyl ester. The free acid is an oil, but is very unstable, readily giving off H_2S . It gives a characteristic white silver salt which is precipitated from even very dilute solution.—Chem. News, Jan. 26, 1912, 47; from Ber. d. D. Chem. Ger., 44, No. 17.

BORON.

Boron—A Normal Constituent of the Animal Organism.—G. Bertrand and H. Agulhon have detected boron as a normal constituent of the organism of the guinea-pig, rabbit, sheep, ox, and horse. It may be found with relative ease in the horns, hair, bones, liver, and muscular tissue. In the rabbit about 7 kilos of fresh muscle contains 1 Mgm. of boron; the blood of the horse, about one-tenth this amount.—Pharm. Journ. and Pharmacist, Nov. 2, 1912, 553; from Compt. rend., 155 (1912), 248.

Boric Acid—A Constituent of Some Italian Mineral Waters.—R. Nasini and C. Porlezza state that boric acid is present in the mineral waters of the Salso Maggiore springs in the amount of 2.5 Gm. per liter—a quantity which would give a pronounced antiseptic action to these waters, confirming at the same time the harmlessness of the acid.—Chem. News., Dec. 6, 1912, 281; from Atti della Reale Acad. dei Lincei, 1912, No. 7.

SILICON.

"Siloxide"—A New Kind of Glass.—"Siloxide" is a name which has been given to glass obtained by fusing pure anhydrous silica with oxides of elements of the silicon-carbon group, as titanium dioxide or zirconium oxide. The new glass, which is now being manufactured at Frankfort, a/M, Germany, is said to be formed by the solution of these refractory oxides of an acid character in silicic acid, and it is said to be more easily worked than pure quartz glass—in fact, it can be worked by the ordinary methods employed in glass manufacture. The two kinds are distinguished as "Z-siloxide," or zirconium glass, and "T-siloxide," titanium glass. While these are said to lack the silky lustre of quartz glass, it is stated by Thomas that they possess distinct advantages over the latter in respect to strength, resistance to devitrification, and resistance to the action of alkalis. The best Z-siloxide with respect to strength is said to contain 1% of zirconia, while that containing 0.5% has the most satisfactory thermal properties. It is said that

zirconium glass has a softening point not much different from that of quartz glass, but that it resists deformation better at high temperatures because of its greater viscosity. The T-siloxide is said to be even superior to Z-siloxide with respect to thermal properties—to be more satisfactory when temperatures up to 1500° C. are to be used—while otherwise its properties are the same as those of Z-siloxide.—Chem. News, July 26, 1912, 46.

"Siloxyd" Glass—Advantages and Superiority Over Quartz Glass for Chemical Apparatus.—A recent U. S. Consular Report from Zürich, Switzerland, gives some interesting particulars respecting the discovery and utility of "siloxyd" glass. The raw material from which the glass is produced is washed quartz-sand, containing 95% of silicic acid, which is melted in an electric furnace in which the temperature rises to 2000° F. All the agencies known to the glass-working industry, including air, steam, gases, etc., can be applied, and it is now possible to melt and to mould into almost any desired form as much as fifty pounds of quartz. A remarkable quality of the quartz produced by the thermoelectric process is its resistance to acids. Even boiling acid, with the possible exception of hydrofluoric or phosphoric, will not corrode it. Moreover, it has the advantage of a coefficient of expansion about one-seventeenth that of the best glass suitable for chemical utensils and apparatus. The chief objection to pure quartz glass as a material for apparatus used in the chemical industry is that it becomes brittle at high temperatures, passing from the amorphous to the crystalline state with a diminution of strength. By the new process discovered by Dr. Wolf-Burkhard, which consists in combining with the raw quartz certain metallic oxides difficult to fuse, the resulting mixture gives on fusion a transparent glassy mass which fuses at a temperature of 1750°. The advantages claimed for this material over ordinary quartz glass are that its strength is 30 to 50 per cent. greater than "quartz gut," tested by bending, and 10 to 30 per cent. more tested by pressure, and that it is less brittle, the devitrification being only about half that of quartz glass. The superior advantages claimed for "siloxyd" glass give to this new material a wide range of usefulness, and especially for apparatus used in the acid industry, most of which have heretofore been made from platinum.—Chem. News, Aug. 23, 1912, 91; from Chem. Engineer, xv, No. 5.

"Siloxide" Glass—External Properties, Color, Finish, etc.—In a paper describing experiments undertaken with a view to determining how the most important properties of the "siloxide" glasses can be

compared with those of quartz glass, Dr. Felix Thomas describes the external properties, color, finish, etc., of zirconium and titanium "siloxide."

Zircon Oxide-Silicic Acid (Z-Siloxide; Zircon Glass).—The superficial appearance of zircon glass tubes is not as alluring as that of the English "vitreosil" (quartz glass) tubes, with their silky surface, but this is the only point in which zircon glass falls short of "vitreosil." They have a dull finish and, if rich in zircon, a pale yellow color, and appear to be denser and firmer than the ordinary quartz glass products.

Titanium Oxide-Silicic Acid (T-Siloxide; Titan Glass).—The products have a bluish color, varying from light blue to dark, according to the quantity of titanium added. In the case of a small percentage of titanium the glass, if in thinnish flakes, compares quite favorably with quartz glass in point of transparency; in the case of a greater percentage of titanium the glass is of course far less transparent, a circumstance which, however, is of no consequence for most purposes.—Chem. News, Sept. 6 and 27, 1913, 119 and 156; from Chem. Ztg., 1912, No. 4.

Silicide of Magnesium—Method of Preparation and its Decomposition by HCl.—A. Berson prepares magnesium silicide as follows: An intimate mixture of dry quartz powder and dry powdered magnesium is ignited in an iron crucible by means of a little magnesium powder on the surface, to which a match is applied. When the reaction is over a homogeneous mass of magnesium silicide is left in the crucible. When it is treated with HCl a mixture of hydrogen and silicomethane and silicoethane is obtained, the amount of hydrogen silicides present depending on the pressure and the rate of evolution of the gas.—Chem. News, March 8, 1912, 119; from Compt. rend., 154 (1912), No. 3.

CARBON.

Carbon Compounds—Classification.—In a comprehensive paper read before the American Philosophical Society, Professor Marston Taylor Bogert discusses the various methods of classification which have been employed for carbon compounds, briefly sketching the changing conceptions and theories of which these methods were to a large extent the natural reflection, and confining himself to the classifications which have been used for textbook instruction in organic chemistry. Tracing the gradual development of organic chemistry from the earliest times, it must suffice here to say that the

present system of classification of carbon compound is based on the subdivision of organic chemistry into "fatty" (or "aliphatic") and "aromatic" chemistry,—terms which first appeared about 1858, and which, at first used in more restricted sense, were extended gradually until the former covered all "acyclic" compounds and the latter nearly all cyclic. This subdivision of organic chemistry has been generally adopted (with few exceptions) ever since; but, with the filling in of the gaps heretofore existing between aliphatic and aromatic chemistry, the author thinks the time is now appropriate for a change in our classification of carbon compounds which shall recognize the essential unity of the subject. The method which appeals particular to him, and which he has followed with his classes at Columbia University for the past decade, is in brevity as follows:

"Begin with the hydrocarbons, as the simplest carbon compounds, and discuss in succession the various series of hydrocarbons, saturated and unsaturated, acyclic and cyclic, before passing on to the next group. After a careful consideration of these fundamentally important compounds, other classes of carbon compounds are taken up in a similar manner; all of the simple halogen derivatives being considered together, all the nitro bodies, all the alcohols, and so on. All other classes are very conveniently regarded as derivatives of the hydrocarbons. With a knowledge of the properties of the various series of hydrocarbons, the study of their derivatives then resolves itself chiefly into the following questions: (1) What are the characteristic properties of the group under consideration (be it halogen, amino, carboxyl, or any other group? (2) In what manner are its properties influenced by the hydrocarbon nucleus to which it is attached, and by the other groups present? (3) How are the properties of the entire molecule likely to be affected by the introduction of such an element or group. Further details and explanations may be consulted in the original reprint from the Proc. Amer. Philos. Soc. (July, 1912, 252-268), in Amer. Jour. Pharm., Sept. and Oct., 1912, 405-413 and 455-462.

Carbon Compounds—Prefixes, Suffixes, Syllables, Letters and Signs Used in Naming Them.—The difficulties in the way of devising a rational and comprehensive system for the naming of carbon compounds and the widely divergent views held by authors and teachers in regard to the system to be adopted, pointing obviously to the need and advantage of uniformity and rationalism, Professor William A. Puckner conceived it his duty to publish some years ago

(see Proceedings 1907, 864), a compilation of terms, syllables, prefixes and endings employed in the naming of these compounds. Inquiries, which have since come to him as Secretary of the Council of Pharmacy and Chemistry, A. M. A., regarding the system used for naming organic compounds in "New and Non-official Remedies," have now made it desirable to publish a more extended register for the benefit of teachers, particularly those in schools of medicine and pharmacy who treat of organic compounds, and as a convenient means of reference for physicians and pharmacists in general. Professor Puckner considered it desirable to include in this list all syllables, prefixes and suffixes which are in general use in the naming of carbon compounds, but no attempt has been made to make the list complete; nor did he consider it expedient to increase the size of the work by including the origin and warrant for the terms used, however interesting these might be. He has avoided as far as possible to voice his personal preferences for a particular system of nomenclature, but instead has given definitions for all the terms in common use without preferences.—Amer. Journ. Pharm., March and April, 1912, 104 to 119 and 167 to 188.

Carbon Tetrachloride—Industrial Value as a Solvent.—An unsigned article (J. Am. M. Assoc., 1912, v. 59, p. 1470) points out that carbon tetrachloride is being adopted as a solvent in industrial extraction processes as a substitute for petroleum benzin. One of its chief advantages is its lack of inflammability and danger of explosion which has made it particularly useful in dyeing and cleaning establishments. (M. I. W.)

Carbon Monoxide—Dangerous Qualities.—An interesting pamphlet on carbon monoxide has recently been issued by the Bureau of Mines, in which attention is drawn to the dangerous properties of this gas and to the use of mice and birds for detecting its presence in mine air. Quoting largely from various publications of Dr. J. S. Haldane of Oxford University, who for many years has made a study of the subject of mining hygiene and the dangerous gases met in mines, the statement of Haldane is pointed out that "carbon monoxide has no other effect than that resulting from its interference with the oxygen supplied to the tissues, and that apart from its property of combining with the hæmaglobin it is physiologically indifferent, like nitrogen." Furthermore, the author of this pamphlet outlines an experiment in which he remained for twenty minutes in an atmosphere containing 0.25 per cent. of carbon

monoxide, "at the end of which time he suffered only a slight headache, although later he became ill. The illness lasted several hours and was accompanied by nausea and headache."

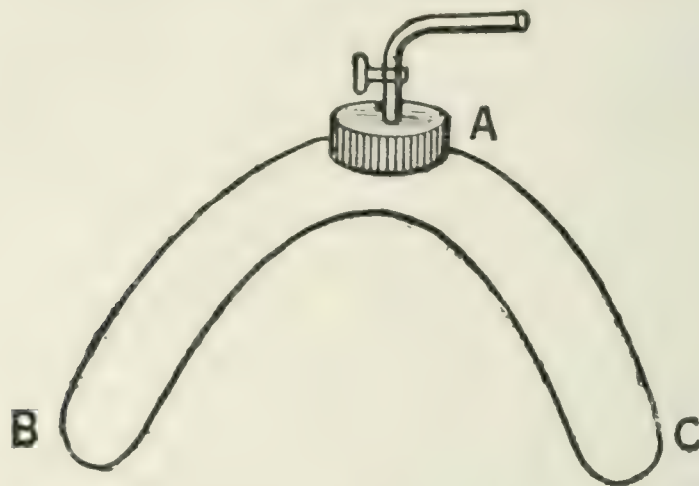
The quotation from Haldane, and this experiment, being likely to give a false impression as to the dangerous properties of this gas, Henry S. Munroe, Professor of Mining, Columbia University, New York, communicates some facts regarding the dangerous nature of carbon monoxide even when present in very small percentage, so that others may not be led to repeat the experiment made by the author of the pamphlet referred to. He says that "carbon monoxide is a product of incomplete combustion. It is present in large quantities in producer gas and water gas, and in dangerous amounts in the gases from boilers and furnaces of all kinds. It is often present in large proportion, and always in dangerous amounts, in powder smoke, in the gases from underground as well as surface fires, and in the after-damp from explosions of fire-damp and coal dust."

Regarding its action, Prof. Munroe says "carbon monoxide has the property of forming a compound with the hæmoglobin of the blood. The effect of this is to make the hæmoglobin, so combined, practically inert and to prevent it from acting as a carrier of oxygen. When so much carbon monoxide is absorbed that the greater part of the hæmoglobin is inert, death results." One of the most serious dangers from the presence of carbon monoxide in the air of mines is the effect upon the health of workmen who are daily exposed to breathing small amounts of this gas. The blood, when partly saturated, is thereby less able to perform its proper function, so that the patient suffers from anæmia and all the complications that may result from this weakened condition. Recent observations have shown that for some hours after a blast, under ordinary mining conditions, carbon monoxide may be present in the air in dangerous amounts, and undoubtedly men engaged in sinking, drifting, and stopping where the circulation is deficient have their blood partially saturated with carbon monoxide the greater part of the time.—*Amer. Journ. Pharm.*, Sept. 1912, 401-404; from *School of Mines Quarterly*, July, 1912, 340-344.

Carbon Dioxide—Simple Apparatus for its Estimation.—W. R. Forbes describes the apparatus shown by Fig. 46, which has the merit in simplicity of construction and in being easily cleaned. A glass tube of suitable bore is bent so as to form two limbs, *B* and

C, sealed at the ends. It is provided at *A* with a ground-glass stopper carrying a delivery-tube and tap. In use, the acid is placed

FIG. 46.

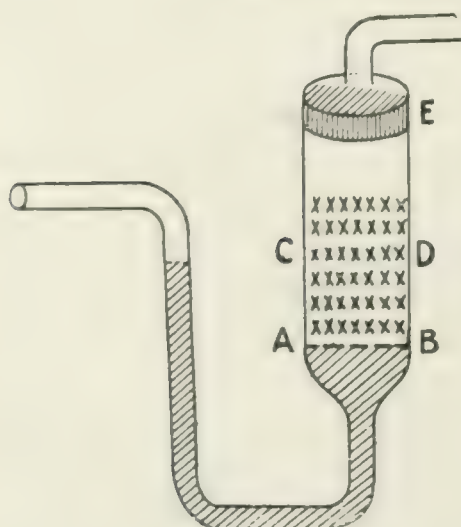


into limb *C* and the carbonate into limb *B*, the action being commenced by tilting the apparatus.—Chem. News, Dec. 13, 1912, 284.

Carbon Dioxide—Volumetric Determination.—Leon T. Bowser describes a form of apparatus for a volumetric determination of CO_2 . The CO_2 is generated from the sample in a small flask, by means of acid, and distilled over into a strong alkaline solution contained in an absorption tower, containing glass beads. The CO_2 is absorbed in the alkaline solution in the tower and is afterwards titrated by means of standard acid, phenolphthalein and methyl orange being used as the indicators, and hydroxide being neutralized and the carbonate converted into bicarbonate with phenolphthalein

as indicator, the titration is then finished with methyl orange. The advantage of the method lies in the form of apparatus used.—Journ. Ind. & Eng. Chem., March, 1912, Vol. 4, p. 203. (L. A. B.)

FIG. 47.



Potash Bulb.

Potash Bulb—Simple Modified Form.—W. R. Forbes describes a modification of Waters' modified Geissler's potash bulb, which combines the essential qualities of being simple in form, easily cleaned, and a good absorber. In a tube drawn out in the form shown by Fig. 47, internal glass projections are fused at *A* and *B*

on which a perforated plate rests. Upon this glass-wool is packed fairly loosely as far as *CD*, and beyond this it is very loosely packed. The tube is closed at *E* by a ground-glass stopper, which carries the exit tube. The tube is filled to *CD* with potash solution, the layer of glass-wool above this retarding evaporation and the carrying of much moisture by the issuing gas.—Chem. News, Nov. 8, 1912, 225.

Carbon Dioxide.—Ahlborn, Maurice B., describes and illustrates a simple method for making carbon dioxide snow. For collecting the snow he uses the finger of an old glove tied securely to the outlet of the carbon dioxide tank.—J. Am. M. Assoc., 1912, v. 58, pp. 1009-1010. (M. I. W.)

Carbon Dioxide.—Boyer, Gouverneur H., describes and illustrates a cheap and portable apparatus for forming carbon dioxide pencils and call attention to the small tubes filled with liquid carbon dioxide commonly used for inflating automobile tires.—J. Am. M. Assoc., 1912, v. 58, pp. 1939-1940. (M. I. W.)

Percarbonates—Isomeric Forms.—Carbonates containing peroxide oxygen are grouped by E. H. Riesenfeld and W. Man in three classes: (1) Carbonates with H_2O_2 of crystallization, for example, $\text{Na}_2\text{CO}_3 \cdot 1\frac{1}{2}\text{H}_2\text{O}_2$. (2) Mono-peroxy-carbonates, for example, Na_2CO_4 . (3) Mono-peroxy-dicarbonates, for example, $\text{Na}_2\text{C}_2\text{O}_6$. The salts of the first and second series are isomeric, exhibiting coordination isomerism. The salts $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}_2 \cdot \frac{1}{2}\text{H}_2\text{O}$, and $\text{Na}_2\text{CO}_3 \cdot 1\frac{1}{2}\text{H}_2\text{O}$ have the same stoichiometric composition, but differ in chemical behavior; thus the former separates no iodine from a neutral potassium iodide solution, while the latter sets free an amount which amounts to about one-third of its active oxygen. Percarbonates exhibit a different kind of isomerism. When prepared electrolytically they separate iodine almost quantitatively from potassium iodide solution, but when they are prepared by the action of carbon dioxide on alkali peroxide only about one-third of the iodine is set free. The per carbonates obtained by electrolysis appear to be analogous to the salts of persulphuric acid, while those obtained from carbon dioxide and alkali peroxide resemble the salts of sulphoperoxy acid.—Chem. News, Feb. 2, 1912, 60; from Ber. d. D. Chem. Ges., 44, No. 18

Carbon Pernitride—Preparation and Properties.—G. Darzens has succeeded in preparing true carbon nitride $\text{C} \vdots \text{N}$. To a thoroughly cooled solution of sodium nitride cyanogen bromide is cautiously added. The latter dissolves, with rise of temperature, the reaction occurring according to the equation $\text{NaN}_3 + \text{CNBr} =$

$\text{NaBr} + \text{N}_3 + \text{C} + \text{N}$. In a few hours the liquid becomes homogeneous. It is then extracted with ether, and the dried ether solutions are evaporated by a current of dry air. The pernitride remains as a colorless liquid, which, when exposed *in vacuo* over sulphuric acid, soon crystallizes in colorless, odorless needles, melting at 35.5° to 36°C . It is soluble in water and in most organic solvents; less soluble in petroleum ether, which precipitates it from solution in benzene. It may be sublimed *in vacuo*; it begins to decompose at 70°C .; at $170\text{--}180^\circ \text{C}$. it detonates with great violence. It is extremely sensitive to shocks, and, therefore, must be handled in small quantity with extreme care. When quite pure it may be kept for a long time. If it contains a trace of bromine it is polymerized into a form insoluble in ether, which no longer detonates. Its aqueous solutions are quickly hydrolyzed. It appears to be the most endothermic of all known bodies. In the first calorimetric experiment to determine its heat of formation such a violent explosion occurred that the platinum capsule containing it was rent into fifty pieces. The percussion loosened the screw of the bomb, and there was an important leakage. In spite of this the heat of decomposition was near 85.2 calories. A second experiment, with less, diluted in amyl alcohol gave 9.26 calories. A third trial with the solid polymer gave 82.2 calories. In each case the platinum container was much damaged, and the enamel of the bomb was affected. In consequence, no further determination could be made.—Pharm. Journ. and Pharmacist, June 16, 1912, 781; from Compt. rend., 154 (1912), 1232.

CYANOGEN.

Sulphocyanic Acid—Preparation and Properties.—According to U. Rueck and H. Steinmetz, sulphocyanic acid may be readily obtained by triturating an alkali sulphocyanide with a bisulphate. It is a colorless gas having a pungent odor and irritant action on mucous membranes, but has relatively slight toxicity compared with hydrocyanic acid gas. It solidifies on cooling to -30° or -40°C ., forming a white crystalline mass, very soluble in water, in ether, and in alcohol.—Pharm. Journ. and Pharmacist, Dec. 28, 1912, 811; from Ztschr. Anorg. Chem., 77 (1912), 51.

Prussian Blue in Tea—Detection.—Fred West submits the following test as a means of detecting Prussian Blue in tea:

Grind about 15 Gms. of the tea in a mortar until it passes through a No. 20 seive.

Place thin, smooth filter papers, 11 Cm. in diameter, on glass plates and moisten each filter paper with solution oxalic acid, removing any air bubbles from under paper.

Sprinkle the ground tea leaves over the filter papers, being careful not to sift the tea so quickly that the particles of tea overlap. Allow the filters to dry on the plates in the air, brush off the particles of tea leaves with a stiff brush, when, if the tea be colored with Prussian Blue, it will be indicated by bright blue spots upon the filter.—Journ. Ind. and Eng. Chem., July, 1912, Vol. 4, p. 528. (L. A. B.)

ALKALIES.

Alkali Hydroxides—Partial Conversion into Higher Oxides by Ozone.—According to Wilhelm Traube, when ozone acts on solid potassium hydroxide most of it is converted into ordinary oxygen, but a small portion is taken up by the alkali, giving a reddish yellow compound. The crude product is not a single substance, but contains, besides unchanged hydroxide, at least two higher oxides of potassium. One of these is characterized by the fact that in contact with water it gives up all the oxygen it contains in excess of that present in KOH, in the form of indifferent oxygen. Potassium tetroxide is also formed. At the ordinary temperature the “ozonized potash” gradually loses its color, and is converted into a mixture of potassium hydroxide and tetroxide.—Chem. News, Nov. 8, 1912, 234; from Ber. d. D. Chem. Ger., 45 (1912), No. 11.

Potassium—Localization and Function in Plants.—The localization of potassium in plants is effected according to D. T. Weevers, by means of Macallum's micro-chemical test, which is based on the precipitation of potassium cobalt nitrate, and subsequent conversion of this into black cobalt sulphide by treatment with ammonium sulphide. In the tissues tested it is shown that the cell nucleus contained no trace of potassium, and that the larger portion of the potassium is contained in the vacuoles of the cells, the chromatophores being free from it, and so with the chlorophyll. Potassium was always found in a form soluble in water, and could be extracted by water or 50 per cent. alcohol almost completely but was insoluble in ether. In phanerogamous plants the potassium is most abundant in the parenchyma, especially in the growing points and reserve organs; in the secondary tissues it predominates in the living elements of the wood and bark, especially in the cambium and medullary rays, the latter seeming to act as potash reserves for the growth of new shoots. It is considered that potassium plays little

or no part in carbon assimilation, but probably is concerned more in building up protoplasm at growing points. In the leaf, it probably functions in synthesis and degradation of the protein.—Pharm. Journ. and Pharmacist, Feb. 24, 1912, 249; from Rev. des Trav. botan. Néerland, viii, 289, through *Nature*, Jan. 25, 1912, 423.

Sodium Chloride—Poisoning.—P. H. Campbell reports a peculiar case of common salt poisoning in a healthy boy of five years. The mother, believing that the child had worms, gave an enema consisting of a pound of salt in a quart of water. The enema was given at 5 p. m. and within ten minutes symptoms of poisoning were evidenced. The child complained of severe pains in the head, became intensely thirsty, vomited violently, and soon began to purge violently. Within thirty minutes the boy became unconscious and had one convulsion after another. The symptoms increased steadily until 10 p. m., when the child died.—J. Am. M. Assoc., 1912, v. 59, p. 1290. (M. I. W.)

Sodium Chloride Poisoning.—An editorial (J. Am. M. Assoc., 1912, v. 59, p. 1297), calls attention to a second case of sodium chloride poisoning reported by Brooks (Arch. Int. Med., November, 1910, p. 577), in which the patient received about nine ounces of salt. (M. I. W.)

Lithium—Historical Outline.—F. Berger gives an interesting outline of the history of lithium and its supposed therapeutic action. The paper is accompanied by an excellent bibliography.—Schweiz. Wschr. f. Chem. u. Pharm. 1 (1912), No. 40, 597. (H. V. A.)

ALKALINE EARTHS.

Barium Sulphate—Precautions When Used in the Röntgen Therapy.—It has become customary in recent years to administer certain insoluble bismuth compounds and also barium sulphate for the purpose of rendering the walls of the stomach impenetrable to the Röntgen rays applied for diagnostic purposes. Since the introduction of barium sulphate into the technic of Röntgen diagnosis several cases of poisoning have occurred, due, it is true, to the use by mistake of a soluble barium salt, in a case mentioned by Prof. Krause, of barium sulphide, in another case by barium carbonate. The latter, although quite insoluble in water, as is the sulphate, differs in that it is soluble in acid aqueous fluids, and since in its general appearance it resembles the sulphate, a mistake by which the carbonate is substituted for the sulphate is more likely to repeat itself than that of substituting the sulphide, which is attri-

butable solely to ignorance. The other barium salts, all of which are soluble in water, are less likely to be used, since they are readily distinguished from the sulphate by their physical characters. But even when the sulphate is used, it should be preliminary tested so as to insure the absence of barium compounds soluble either in water alone or in acidulated water.—Pharm. Ztg., lvii (1912), No. 45, 454.

Calcium and Lime—Atomic and Molecular Weights.—Oechsner de Coninck has determined the molecular weight of lime by preparing pure calcium formate from lime and formic acid and converting the formate into the oxide by heating. The means of five experiments given the molecular weight 56.02 for the lime and 40.02 for the atomic weight of calcium.—Chem. News, Feb. 9, 1912, 71; from Compt. rend., 153, No. 26.

Calcium Carbonate—Formation of Double Carbonates with Sodium and Potassium.—Barre finds that when precipitated calcium carbonate is kept suspended in solution of sodium carbonate at certain definite strengths and at certain temperatures, the double salt, $\text{CaCO}_3 \cdot \text{NaCO}_3 \cdot 2\text{H}_2\text{O}$, slowly forms and separates out in orthorhombic prisms. This compound is formed more rapidly at the boiling point of the mixture than at 50°C ., and is not formed below 16°C . With potassium carbonate, the analogous salt, $\text{CaCO}_3 \cdot \text{K}_2\text{CO}_3$, is formed in prismatic needles. These double carbonates are slowly dissociated in water. Calcium carbonate is less soluble in these solutions of alkali carbonates than it is in water. Barium carbonate and strontium carbonate do not form similar double salts.—Pharm. Journ. and Pharmacist, April 13, 1912, 485; from Compt. rend., 154 (1912), 279.

Magnesia—Calorimetric Determination in Magnesium Carbonate.—V. Fortini describes a rapid calorimetric method for the determination of added magnesium oxide in magnesium carbonate or its mixtures with asbestos. The process depends upon the fact that the reaction, $\text{MgO} + 2\text{HCl} = \text{MgCl}_2 + \text{H}_2\text{O}$, is accompanied by a marked evolution of heat, while there is no heat change during the reaction, $\text{MgCO}_3 + 2\text{HCl} = \text{MgCl}_2 + \text{CO}_2 + \text{H}_2\text{O}$. By observing the temperature change when the sample is mixed with hydrochloric acid, small quantities of calcined magnesia can be detected in magnesium carbonate. The result is not affected by any added substance such as asbestos, unless it is attacked by hydrochloric acid with evolution of heat. Any form of calorimeter having a stirrer and a delicate thermometer and made of a material which is not attacked by hydrochloric acid, may be used. Tortelli's

Thermoleometer, which is made entirely of glass, is a suitable instrument. Twenty-five Cc. of hydrochloric acid (sp. gr. 1.019, diluted with the same volume of water) is run into the flask and the temperature taken. About 0.5 to 1 gramme of the sample under test is then weighed by difference into the acid and the rise in temperature observed after shaking the mixture. Using always the same calorimeter and the same quantities of materials, the rise in temperature is proportional to the heat of reaction, and therefore to the added magnesia (0.1 gramme MgO gives a rise of 3.7°). Allowance must be made for the basic carbonate normally present in commercial magnesium carbonate, which produces a slight rise in temperature.—Pharm. Journ. and Pharmacist, May 18, 1912, 647; from Chem. Ztg., 30 (1912), 270.

Magnesium Peroxide—Degree of Purity.—Puckner, W. A., reports that while MgO_2 is advanced as a chemical formula for magnesium peroxide, examination in the laboratory showed that the several commercial brands contain only 12.17 to 25.18 per cent. of real magnesium peroxide.—J. Am. M. Assoc., 1912, v 59, pp. 1157-1158. (M. I. W.)

Magnesium Suphate—Laxative Action.—An editorial (J. Am. M. Assoc., 1912, v. 59, pp. 38-39), reviews some of the recently published literature on the laxative action of Epsom salts, and points out that the latest work on this problem appears to speak against any specific stimulating effect of magnesium sulphate on intestinal movement. The unique laxative property of certain of the salts presumably cannot be explained on the basis of any exceptional effect on peristalsis. For the present, therefore, Glauber's and Epsom salts may remain in the group of the saline purgatives which owe their efficiency to the difficulty which they present to the processes of absorption. (M. I. W.)

ALUMINUM.

Anhydrous Alumina—Superiority as a Drying Agent for Gases.—It is claimed in "Chem. Eng. and Works Chem." (Nov., 1912, 302), that anhydrous aluminum sesquioxide, prepared by dehydrating the precipitated hydroxide at as low a temperature as possible, is a powerful material for drying gases. It is used exactly like calcium chloride or phosphorus pentoxide, but absorbs water vapor better than either of them. Heat is developed during the absorption. The alumina can be again dehydrated by careful heating as often as may be necessary.—Pharm. Journ. and Pharmacist, Dec. 21, 1912, 781.

Aluminum Peroxide—Preparation and Properties.—According to A. Terni aluminum peroxide may be prepared by making a concentrated solution of potassium aluminate from freshly precipitated aluminum hydroxide dissolved in the smallest possible quantity of 50 per cent. potassium hydroxide solution, and treatment with excess of a 30 per cent. solution of hydrogen peroxide. The precipitate formed is filtered off with the aid of the air pump, washed with water, then with alcohol and ether, and dried in the air. The product is a light, amorphous, white powder, having the composition $\text{Al}_2\text{O}_3 \cdot \text{Al}_2\text{O}_4 \cdot 10\text{H}_2\text{O}$, and the properties of a true peroxide. It is soluble in alkalis, without evolution of oxygen.—Pharm. Journ. and Pharmacist, Oct. 26, 1912, 519; from Atti R. Acc. dei Lincei, Roma, 21 (1912), ii, 104, through Journ. Soc. Chem. Ind., Sept. 16, 1912, 814.

Aluminous Nitride—Fixation of Nitrogen by the Assistance of Carbon.—S. A. Tucker and H. L. Reed describe their endeavor to find out whether nitrogen would combine with a heated mixture of alumina and carbon, with special regard to the most suitable condition for bringing about the reaction. Using 1 to 2.5 Gm. of a mixture of Al_2O_3 and C in atomic ratio 1 to 3, previously dried at 110° , this charge was placed in a small porcelain boat, introduced into a wire-wound electric resistance furnace, and nitrogen, carefully freed from oxygen and dried, was led into the furnace heated to different degrees of temperature. The results convinced the authors that aluminous nitride, AlN , may thus be obtained, the yield depending on the temperature, the maximum (30.19%) being obtained between 1800° and 2000° . Whenever the yield of nitrogen approached the theoretical (34.06%) the product was a nearly white amorphous substance with occasional particles of undecomposed carbon. It would seem that the effect of heating Al_2O_3 and C is first to produce nascent Al, which under ordinary conditions forms Al_4C_3 ; but in the presence of fairly pure nitrogen the aluminium seems to have a greater affinity for nitrogen than for carbon.—Pharm. Journ. and Pharmacist, Nov. 30, 1912, 679; from Chem. Trade Journ., Nov. 23, 1912, 538.

Clays—Peculiar Odor and Taste Probably Due to Bacteria.—P. Rohland observes that certain clays have a peculiar odor and taste, which can be communicated to other substances with which they come in contact. The odor of kaolin, for example, becomes perceptible only when the kaolin is moistened with water, or better still, with an alkaline solution. In clays of this kind, minute organisms, probably bacteria, may have played some part, and the

remains of these organisms would account for the characters referred to. The fact that kaolins contain organic matter lends support to this view.—Pharm. Journ. and Pharmacist, Nov. 30, 1912, 679; from Ztschr. f. Physiol. Chem., 81 (1912), through Journ. Soc. Chem. Ind., Nov. 15, 1912, 1033.

Corundum—Separation from the Ore and Purification.—Walter C. Gold contributes an interesting paper on the production and purification of corundum from Canadian ore, an immense deposit of which has been discovered during the past decade at Combermere, Barry's Bay, Ontario. Although this deposit yields but eight per cent. of pure corundum, the principle associates of which are spar, iron, pyrites, and mica, by a method of "washing" and "concentration" it is profitably produced in a pure condition, an essential condition for the production of grinding wheels. It is moreover, much cheaper than that hitherto obtainable from the limited deposits in other parts of the world: in India and Australia; in our own country, in Montana, in North Carolina (near Asheville), in Georgia, while the finest corundum ever produced came from Unionville, Chester County, in Pennsylvania. Here the ore was of the blue sapphire variety and, here too, were found the only *true* loose crystals—pure crystalline corundum, six-sided and free from impurities; four specimens in the author's possession weighing 1 lb. 9 oz., 1 lb. 13 oz., 1 lb. 9 oz. and 3 lbs., respectively. Throughout the section surrounding Unionville, surface pieces of the sapphire variety are frequently found now, and if a good "lead" could be located it certainly would prove a bonanza, as the Chester County ore produced the best grinding wheels of their type yet supplied the trade.

The discovery of the Canadian mines has completely suppressed the operations of the other American mines, however. The Canadian ore is crushed by great chilled rollers, then run over a "water-table," across the surface of which it passes by specific gravity—the corundum, being heavier than its associated impurities, dropping first from the "table." The corundum is then passed through a long cylindrical drier and from there it moves to the sieves or screens made from bolting cloth, whereby it is separated into powders of different degrees of fineness, which are numbered from 6 to 180, and are in series termed "coarse grain," "fine grain," and flour. In this form it answers all ordinary use; but for the production of grinding wheels it must be freed as much as possible from the micaceous associates and other foreign matter by the so-called "concentration," a process which has in recent years been

greatly improved. The iron (about $4\frac{1}{2}\%$) is finally removed by running the corundum over a magnetic separator.

There are a number of varieties of corundum: Sapphire, pink, cream, and white—the quality depending solely upon the percentage of aluminum oxide. Canadian corundum, when perfectly cleaned, contains 95 per cent. of alumina, while southern corundum contains about 75 per cent. on the average. The specific gravity is 3.95 to 4.05. Pure corundum is number 9 on the scale of hardness, the diamond being rated as 10.

The greater purity of the "concentrated" corundum assures a product which will cut more keenly and prove more durable than otherwise, and is of particular importance in the manufacture of grinding wheels which are apt to crack from the formation of "fluxes," during the vitrification (at about 2500° F) of the wheels, with the impurities that may be present.—*Amer. Journ. Pharm.*, Feb., 1912, 61-64.

Kaolin—Rapid Method of Analysis.—E. Ladd states that if kaolin is calcined to expel its combined water, it becomes soluble in concentrated hydrochloric acid. The analysis accordingly is greatly facilitated by heating the dried sample to redness over a full Bunsen flame (without blast) for twenty-five minutes; whereupon the dehydrated kaolin is digested with concentrated hydrochloric acid on the hotplate for two hours, and the analysis then carried out in the usual way.—*Pharm. Journ. and Pharmacist*, Sept. 14, 1912, 345; from *Min. and Eng. World*, June 29, 1912, 1350, through *Journ. Soc. Chem. Ind.*, Aug. 15, 1912, 723.

YTTRIUM.

Yttrium—Quantitative Determination.—Having encountered difficulties in the determination of yttrium in the presence of sodium, C. F. Whittemore and C. James made a systematic study of its quantitative determination in the presence of this and certain other elements. As a result they find: (1) that ammonium sebacate affords a quantitative separation of yttrium from sodium; (2) that a double precipitation with the same reagent gives a complete separation from potassium; and (3) that oxalic acid, in the presence of ammonium chloride, effects a perfectly satisfactory separation from iron, aluminum, lithium, and magnesium.—*Chem. News*, July 5, 1912, 1-2.

Yttrium—The Quantitative Determination.—C. F. Whittemore and C. James found that yttrium could be quantitatively separated from sodium by means of ammonium sebacate, the average yield be-

ing 0.1578 Gm. Y_2O_3 found in place of 0.1575 Gm. calculated. It was found that in the presence of potassium, a double precipitation with ammonium sebacate was necessary to effect complete separation of the yttrium from the potassium. Oxalic acid in the presence of ammonium chloride effects a perfectly satisfactory separation from iron, aluminum, lithium, and magnesium, the precipitation being carried out in the cold.—J. Am. Chem. Soc., June, 1912, Vol. 34, p. 772. (L. A. B.)

THALLIUM.

Thallium—Marked Depilatory Property.—R. Laboureaud calls attention to some singular properties of thallium which, in a certain case, five days after a dose of 0.02 Gm. of the acetate, produced total baldness, and the growth of hair was retarded for about six months. This property of thallium was at first made use of by the author to destroy the hair *en masse* in the treatment of ringworm, using an ointment containing thallium, but the general toxic effects which developed showed that the medicament was a dangerous one. On the other hand, the author was able to dispel successfully the troublesome down which gave annoyance to young women. In such cases, the surface to be treated was always small, so that there was little fear of accident. The formula he recommends is as follows:

Thallium acetate.....	0.30 Gm.
Zinc oxide.....	2.50 Gm.
Soft paraffin.....	20.00 Gm.
Lanolin	5.00 Gm.
Rose water.....	5.00 Gm.

A small piece of this ointment, no larger than the bulk of one or two grains of wheat, is applied to the lip every night. This suffices to bring about the destruction of the hair or down. In those cases where the hair is brown, and about one centimetre long, its disappearance is rapid. It is naturally replaced, however, by fresh growth, but the regular use of the ointment ensures its remaining short and almost invisible.—Pharm. Journ. and Pharmacist, June 22, 1912, 807; from LaClinique, February 16, 1912,

EUROPIUM.

Europous Chloride—Preparation and Characters.—G. Urbain and F. Bourion prepare anhydrous europic chloride by drying the hydrated chloride at 100° and subjecting it to the action of a current of chlorine and sulphur dioxide, meanwhile raising the temperature. The reduction of this anhydrous chloride leads to the formation of europous chloride, $Eu Cl_2$. This is a white amorphous

looking substance which yields an opalescent neutral solution with cold water. When this solution is concentrated at 100° , it undergoes decomposition, according to the equation: $12 \text{ Eu Cl}_2 + 3\text{O}_2 = 8 \text{ Eu Cl}_3 + 2\text{Eu}_2\text{O}_3$.—Chem. News, Jan. 26, 1912, 47; from Compt. rend., 153, No. 23.

ZINC.

Zinc—Gravimetric Determination.—H. Schilling observes that the separation of zinc as sulphide in presence of acetic acid is a troublesome and tedious operation. The precipitation is only complete after several hours and the precipitate is liable to be partly in the colloidal state, passing through the filter on washing with water. The author finds that these difficulties can be avoided by adding to the alkaline solution of the zinc, before precipitation, phenyl-sulphuric acid instead of acetic acid. The liquid is then brought to boiling, and H_2S passed through it until it is quite cold. Precipitation is complete and filtration and washing easy.—Pharm. Journ. and Pharmacist, Dec. 7, 1912, 711; from Chem. Ztg., Nov. 16, 1912, 1352.

Zinc—A New Reaction.—In the ordinary analytical course the zinc sulphide is dissolved in hydrochloric acid and the zinc is precipitated with potassium ferrocyanide, as zinc ferrocyanide ($\text{Fe}(\text{CN})_6\text{Zn}_2$). In order to identify the latter, Fr. F. Werner has found the following new reaction useful: The precipitate is treated with bromine water, whereupon a deep-yellow oxidation product, characteristic of zinc ferrocyanide, is at once produced. Success however depends, as in all analytical operations, on clean and careful manipulation—Pharm. Ztg., lvii (1912), No. 56, 563; from Ztschr. f. Analyt. Chem., 1912, No. 7 and 8.

Zinc Oxide—Volatility at High Temperature.—O. L. Kowalke finds that zinc oxide can be completely volatilized at temperatures from 1370° to 1400° C. The loss increases rapidly, beginning at 1300° and seems to be similar in nature to the slow evaporation of water below the boiling point, volatilization proceeding rapidly at temperatures above 1400° .—Pharm. Journ. and Pharmacist, July 27, 1912, 99; from Chem. Eng. and Works Chemist, June, 1912, 121.

MANGANESE.

Manganese—Micro-Chemical Tests.—A. Wagener describes a number of micro-chemical tests for the detection of manganese. For this purpose, the alkali fusion test may be used, but another test is the formation of manganese oxalate, which crystallizes in six-

rayed stars. This reaction is very characteristic of manganese, and is easily recognized even in presence of other bodies—*e. g.*, in the ash of cardamom fruits. The formation of crystals does not take place in strong solutions, and, though the presence of a small amount of acid is an advantage, strong mineral acids should be absent; zinc also interferes with the reaction. The test will detect 0.0003 Mgm. Another micro-chemical test is the formation of a double salt with potassium chromate. The crystals are dark brown, and form beautiful rosettes, which appear at first as black points and then grow into the characteristic bundles. The crystals are double-refracting, and are soluble in strong mineral and organic acids. The test must be carried out in a neutral or faintly acid medium; it will detect 0.005 Mgm. Zinc gives with potassium chromate an amorphous precipitate. If the solution contains ten times as much zinc as manganese an excess of reagent must be used. When larger quantities of zinc are present the manganese must be separated as dioxide by adding ammonia and hydrogen peroxide.—Pharm. Journ. and Pharmacist, March 23, 1912, 387; from Pharm. Week, 1, 1912, No. 1.

Manganese—Source of the Metal in the Human Body.—It having been demonstrated by Bertrand and others that manganese is a normal constituent of the human and animal body, P. Carles directs attention to the possible source of the metal, and points out that in the case of man, bread and wine both furnish this. While in the finest flour the amount of manganese is negligible, the coarsest kinds (bran and gruffs) often produce a green ash when incinerated. In the case of wines the case is almost analogous.—Pharm. Journ. and Pharmacist, Dec. 14, 1912, 749; from Annal. Chim. Analyt., 17 (1912), 411.

Potassium Permanganate—Standardization of its Solutions.—R. S. McBride has undertaken a study of the best methods and material for the standardization of potassium permanganate solution.

It was found that sodium oxalate was probably best suited as a standardization material, owing to its cheapness, ease of determining its purity, stability under ordinary conditions, and the convenience, precision, and accuracy with which it may be used.

As the result of large numbers of experiments, and the study of the possible errors entering into the reaction, McBride recommends the following method of procedure:

In a 400 Cc. beaker, dissolve 0.25-0.3 Gm. of sodium oxalate in 200 to 250 Cc. of hot water (80°-90° C.), and add 10 Cc. (1:1) sulphuric acid. Titrate at once, with N/10 KMnO_4 solution.

stirring the liquid vigorously and continuously. The permanganate must not be added more rapidly than 10-15 Cc. per minute, and the last $\frac{1}{2}$ -1 Cc. must be added dropwise with particular care to allow each drop to be fully decolorized before the next is introduced. The excess of KMnO_4 used to cause an end point must be estimated by matching the color in another beaker containing the same amount of acid and hot water.

The solution must not be below 60° C. by the time the end point is reached; if necessary use heat to maintain temperature.—Journ. Am. Chem. Soc., April, 1912, Vol. 34, p. 393. (L. A. B.)

Zinc Permanganate—Nature.—Puckner, W. A., reports that zinc permanganate as found on the market was found to vary considerably. While the best specimens contained as high as 97 per cent. of the theoretical amount, others contained but about 73 per cent.—J. Am. M. Assoc., 1912, v 59, p. 1158. (M. I. W.)

MOLYBDENUM.

Phosphomolybdates—Analytical Separation from Silicomolybdates by H_2O_2 .—In the analysis of minerals and rocks the molybdic reagent is generally used to separate traces of phosphoric acid, but has the disadvantage of also precipitating silicic acid. P. Mélikoff finds, however, that notwithstanding the great similarity of the phosphomolybdates and silicomolybdates, these may be separated by a method based upon their different solubilities in H_2O_2 . Thus a mixture of equal volumes of 30 per cent. hydrogen peroxide and 8 per cent. ammonium molybdate in nitric acid does not dissolve a trace of silicomolybdate, while phosphomolybdate is readily soluble in it.—Chem. News, Feb. 9, 1912, 71; from Compt. rend., 153, No. 26.

IRON.

Organic Iron Compounds—Influence of Light on their Composition.—C. Neuberg has made the interesting observations that nearly all organic substances, which in themselves are not sensitive to the action of light, acquire a pronounced photosensitiveness when they are in admixture with certain inorganic substances. To the latter belong the salts of the heavy metals, which, with the exception of silver salts, are in no respect affected by exposure to light, and among these the strongest effects are produced by the ordinary salts of iron, indifferently whether in the ferrous or ferric state. In these effects the peculiar tendency of the light is manifested by producing from the greatest variety of indifferent structural material

of the organism, substances of higher chemical avidity than that of the original material, such for example as the pronouncedly reactionable aldehydes and ketones. The reduction of the molecule and formation of labile products of change is the common attribute of these photocatalytic processes in the presence of mineral matter.

The author, in collaboration with O. Schwenkel, has practically applied the above observation to a series of investigations of the changes to which a number of medicinal iron preparations are subject by exposing them to light, viz., liq. ferri oxydati sacchar., liq. ferri mangani sacchar., ferrum kalium tartaricum, ferrum malicum, ferrum lacticum, ferrum glycerophosphoricum, and ferri-ammonium citric. The results, which are given in some detail, show that all of these preparations are sensitive to light, and under its influence undergo marked changes, by which from indifferent original components, compounds of more or less pronounced physiological activity (aldehydes, ketones, etc.) are produced. It follows that these preparations, solid or liquid, should be carefully protected from light, and in case of liquids prepared only in small quantities, so that they may be frequently renewed.—Pharm. Ztg., lvii (1912), 77, 778; from Biochem. Zschr. 44, Nos. 5 and 6.

Iron—Precaution in Conducting the G. P. V Test for its Presence.—Wiebelitz points out that when testing for iron with potassium ferrocyanide solution, as directed in the G. P. V, it is essential that the test solution must be freshly prepared for the test. Furthermore, he calls attention to the fact that iron is partially precipitated from acetic acid solution by hydrogen sulphide, and that therefore in sodium bicarbonate and in sodium acetate for example, a contamination by heavy metals must be confirmed by a positive result also in hydrochloric acid solution when carrying out the H_2S test of the G. P.—Pharm. Ztg., lvii (1912), No. 38, 382.

Iron—Acid-Proof Composition.—Iron alloys containing a certain percentage of chromium are usually used in the manufacture of apparatus which should resist the action of acids, but are not absolutely acid proof. The German metallurgist, Prof. Borchers, of Aix-la-Chapelle, discovered that by the addition of 2 to 5 per cent. of molybdenum to an iron composition containing more than 10 per cent. of chromium, an absolute acid proof alloy is obtained. A composition of 35 per cent. iron, 60 per cent. chromium and 5 per cent. molybdenum is unaffected even by hot aqua regia. This alloy has the tenacity of cast iron and can be worked the same. Titanium and vanadium may be used instead of molybdenum, but the latter is preferable.—Sc. Am., 1912, Vol. 107, 191. (O. R.)

Iron—Protection from Rust.—Prof. H. J. Lohmann's patented method to permanently protect ferric articles from corrosion makes it possible to apply to the surface of steel or iron a coating of any non-corrodible metal of the lead group or a combination of these metals. The thoroughly cleaned articles are immersed from one-half to two minutes in the so-called Lohmann bath containing the chemicals. During this period the pores of the metal are freed from oxygen and the amalgamating agent is deposited over the surface so that when it is slipped into the molten metal the pores are entirely filled and an integral union or chemical weld is made between the treated metal and the non-corrodible coating.—*Sc. Am.*, 1912, No. 24, 554-555. (O. R.)

Ferrous Salts—Dimethylglyoxim a Sensitive Reagent.—Paul Slawik finds dimethylglyoxim to be a very sensitive reagent for ferrous salts. If to a drop of the solution of a ferrous salt a little tartaric acid is added, followed by about 1 Cc. of alcoholic solution of dimethylglyoxim and the mixture is then supersaturated with ammonia, an immediate intense red coloration results, resembling that produced by rosolic acid with alkalies. The reaction is more sensitive than any of the known ferrous reactions, but is not so stable on exposure to air, because the ferrous compound is slowly converted into the ferric state and the color disappears when this conversion is complete. It reappears, however, on the addition of a reducing agent, such, for example, as stannous chloride, metallic zinc, etc. The reagent is not suitable for the determination of small traces of ferrous salts, either by themselves or in admixture with ferric salts, since by the supersaturation of the acid fluid with ammonia considerable heat is developed, resulting in the rapid conversion of the ferrous to ferric oxide, which does not give the reaction.—*Pharm. Ztg.*, lvii (1912), No. 13, 126; from *Chem. Ztg.*, 1912, No. 6.

TUNGSTEN.

Tungsten—New Assay Method.—B. M. Divani observes that when tungsten is in the condition of tungstate it is possible to precipitate and estimate the tungsten in the form of the trioxide— WO_3 —all that is needed being to acidify the solution with HCl , HNO_3 , or even H_2SO_4 . But tungstic acid being slightly soluble in mineral acids, it is usually advised to render it insoluble by repeatedly evaporating (and resolution of) the acidulated solution and finally warming the dry residue for some time at 120°C . To avoid this tedious and time-consuming operation, the author now suggests

for study a method based upon the precipitation of tungstic acid by an excess of a solution of freshly prepared stannous chloride (50 Gm. crystals per 200 Cc.), which precipitate the tungsten in the form of the tungsten oxide— W_2O_5 —the reaction being quite sensitive. In the experiment described by the author, 2 Gm. of absolutely pure tungstic acid was dissolved in just enough concentrated ammonia water, and the solution diluted to 1 liter. To 50 Cc. of this solution 20 Cc. of the solution of stannous chloride is added, the mixture is boiled for a few minutes, and the precipitate, after settling, is washed with warm water, then calcined and weighed. The flocculent precipitate settles rapidly in the warm water, so that the washing is quickly effected without loss. The results are quite accurate, as proven by a number of experiments described.—Chem. News, Feb. 2, 1912, 56; from Chem. Engineer, xiv, No. 4.

Colloidal Tungsten—A Substitute for Bismuth in the Röntgen-Therapy.—Colloidal tungsten or wolfram is recommended by Dr. R. Krüger as a substitute for bismuth in the Röntgen diagnostic therapy. It occurs in commerce, as a black, odorless, and tasteless powder, and according to the investigations of Dr. V. Hayek is absolutely non-toxic and may be administered in doses of 25.0 to 80.0 Gm. without hesitation.—Münch. Med. Wschr., 1912, No. 35.

URANIUM.

Uranium—Volumetric Determination.—V. Auger finds that a solution containing iron and uranium can be analyzed volumetrically as follows: The acid solution is reduced by means of zinc amalgam, ammonium sulphocyanide is added, and the solution is oxidized with standard ferric solution till a permanent pink coloration, due to the formation of ferric sulphocyanate, is obtained. This method gives results which are correct to within 0.5 per cent. with mixtures containing up to five parts of iron to one of uranium. Better results are obtained by effecting the reduction by means of titanous solution in presence of concentrated solution of sodium tartrate. The best indicator to use is azo-induline, the violet color of which changes to yellow when there is an excess of titanous salt in the solution.—Chem. News, Nov. 29, 1912, 270; from Compt. rend., 155 (1912), No. 14.

Uranous Oxide—Solubility in Acids.—A. Raynaud finds that hydrochloric, hydrobromic, sulphuric, nitric, nitro-muriatic, and acetic acids, have only very slight action on uranous oxide (UO_2), and that even with the concentrated acids solution takes place very

slowly—in some cases only at the expense of the oxygen of the air or of the solvents. Aqua regia and nitric acid yield uranic salts.—Chem. News, Feb. 9, 1912, 71; from Compt. rend., 153, No. 26.

Uranium Salts—Color Reaction with Poly-valent Phenols.—Dr. J. Siemssen finds that the originally yellow solutions of uranium salts, on the addition of resorcinol, hydroquinone, pyrocatechin, pyrogallol, etc., produces intensely red solutions, which assume a bright red to purple red color according to the degree of concentration. Dyeing experiments on wool undertaken with three solutions resulted in imparting to it a handsome yellow color, but the isolation of the pigment has not yet been successful.—Pharm. Ztg., lvii (1912), No. 29, 294; from Chem. Ztg., 1912, No. 39.

Uranium Salts—Action on Micro-Organisms.—According to the researches of H. Agulhon and R. Sazerac, the salts of uranyl seems to possess special selective power towards certain cellules from an antiseptic point of view. Thus a proportion of 1 in 50,000 hinders alcoholic fermentation, while 1 Gm. of the same salt in 1000 does not affect the development of *Aspergillus* or of the acetic ferment. Moreover, uranium appears to have a remarkable power of increasing certain oxidation processes.—Chem. News, Dec. 27, 1912, 318; from Bull. Soc. Chim. de France, xi-xii, (1912), No. 16.

Uranium Nitrate—Explosion.—Referring to the explosion of radium bromide by the action of water, recorded by Jost (see under "Radium"), W. N. Iwanow mentions that he has observed a similar phenomenon with uranium. A sample of C. P. uranyl nitrate, in crystals, not perfectly dry, was kept in a well-stoppered vessel in a dark cupboard about three years. At the end of the time the crystals appeared unaltered, and gave 55.22 per cent. of uranium oxide (the theoretical amount being 55.38); but while the crystals were being weighed, a small detonation occurred, such as would be given by a small quantity of nitrogen iodide, and on shaking them in a flask with water a regular cannonade occurred. In the dark the explosion of a crystal was seen to be accompanied by the emission of a bright light. Dropping a crystal on the ground caused a flash of light. A newly prepared specimen showed this property more feebly, and gave no explosions through the action of water.—Pharm. Journ. and Pharmacist, May 4, 1912, 571; from Chem. Ztg., March 16, 1912, 297.

RADIUM.

Radium—Its Origin.—In a lecture delivered at the Royal Institution by Professor Frederick Soddy, "On the Origin of Radium," he states that the apparently permanent and constant radio activity of radio-active substances, consists in general of two parts. One cannot, as a rule, be separated from the substance; the other is readily separated by many ordinary chemical and physical operations. When thorium has been deprived of thorium x by simple chemical processes it spontaneously regenerates this constituent after a lapse of time. This question whether the intensely radio-active constituents are regenerated by the disintegration of one or more of the other elements in such minerals forms the subject of the lecture, especially as regards radium. Radium, in the intensity of its activity, and therefore in the rapidity of its disintegration, resembles the short-lived active constituents uranium x and thorium x , whilst in the apparent permanence of its activity it resembles the primary radio-elements. The present estimate of the period of average life of radium is set by Rutherford at 2,500 years. A few thousand years hence the radium in existence today will for the most part have disintegrated. From this arises one of the most interesting and crucial of the problems of atomic disintegration. The quantities of radium which can be detected and recognized unequivocally by radioactive methods are thousands of times smaller than can be detected even by the spectroscope. The first product of disintegration is a gas, the radium emanation, and the delicacy of the test was graphically illustrated by the lecturer opening a tube containing the emanation in equilibrium with 3 milligrams of radium, outside of the lecture-room in front of the fan supplying air to the building. Its presence in the room was quickly (in a few minutes) observable on a screen projection of the electroscope. Only two primary radio-elements, uranium and thorium, were known to change sufficiently slowly to account for the maintenance of radium in the earth. Of these, Mme. Curie selected uranium as the probable primary parent, and experiments indicated the existence in commercial uranium compounds of a substance capable of generating radium with the lapse of time, and indirect evidence pointed to uranium as being the primary parent of radium. But to account for the excessively slow growth of radium it was found necessary to suppose that between the uranium and radium an intermediate product existed, and this product must necessarily be present in uranium minerals, and, therefore, to a greater or less

extent, in commercial uranium salts. Experiments involving separation of radium from uranyl nitrate with repeated extraction with ether confirmed completely the original observation that a substance is present in commercial uranium salts capable of generating radium, and not removed from it by the barium sulphate method used first for separating the radium, but separated, at least mainly, by the ether method. Meanwhile it had been proved that actinium preparations obtained from uranium minerals, and initially free from radium, grew a fresh crop with lapse of time. Still further research proved that it was not actinium, but a new radio-element admixed with it, called ionium; this is radioactive, and its radiation consists entirely of α -rays of very low range. Its chemical nature is absolutely identical, so far as is known, with that of thorium, and it cannot be separated from it, but complete similarity of this kind with known elements is one of the features of the chemistry of radio-elements. Additional evidence was soon obtained to show that the radium formed is derived, not from the uranium, but from varying infinitesimal quantities of ionium unremovable by the purification process. The sum total of the results therefore confirm absolutely the view that uranium does not produce radium directly. At the close of the lecture, however, the lecturer said that there may be more than one intermediate product between uranium and radium, but the available information, indirect though it is, indicates that ionium is the only one.—Pharm. Journ. and Pharmacist, March 23, 1912, 394.

Radium D.—Transformation Constant.—From measurements of the activity of a specimen of mineral containing radium D and its derivations, Paolo Rossi has found that the half period of transformation of radium D is approximately seventeen years.—Chem. News, July 5, 1912, 12; from Atti della Reale Accad. dei Lincei, xxi (1912), No. 7.

Radium—Methods of Measuring Activity and Emanations.—At the May session of the German Pharmaceutical Association, Prof. W. Marckwald delivered an interesting address on Radium and its properties with particular reference to the various methods in use for measuring radium activity in large and small quantities, as well as the emanation content of spring waters. These methods are extremely complicated, but the apparatus for carrying them out have been perfected to such a degree that they can be easily carried out by the pharmacist after a little practice.—Pharm. Ztg., lyii (1912), No. 39, 396.

Radium Bromide—Explosion by the Action of Water.—B. Jost states that in the process of making spinthariscopes it has happened on two occasions that a fragment of radium bromide has exploded into innumerable minute particles. The method employed was to pick up a small portion of the salt on the slightly moistened point of a needle, and it appears that the moisture was the immediate cause of the explosion. It is only very pure radium bromide of a certain age which has behaved in this way; evidently radium-emanation has accumulated within the particles, causing a condition of strain, and the addition of a certain amount of water has weakened the solid sufficiently for the accumulated emanation to shatter it. Too much water does not produce the effect. In one instance one or more of the particles produced by the explosion went into the operator's eye, and caused considerable inflammation. Precht has recorded a similar explosion which occurred in some radium salt in a vacuum tube. It is possible that in this case there was a minute fault in the glass, and that water from this came into contact with the salt.—Pharm. Journ. and Pharmacist, May 4, 1912, 571; from Chem. Ztg., Feb. 3, 1912, 138.

Radium Specialties.—Considering the short time since the discovery of radium and the yet shorter time since its introduction into medicinal use, it is astonishing how large a number of specialties have been and continue to be exploited by enterprising individuals and companies organized for the purpose of supply in radium in various forms. Dr. G. Mossler, of Vienna, has taken the trouble of systematically listing the various preparations now on the market and determining their composition and relative radio-active value, which he has published in the "Zeitschrift des Allgemeinen Oesterreichischen Apotheker Vereins," 1912, No. 9, 19. Omitting his findings this list is here reproduced by their commercial titles in the systematic classification adopted by Dr. Mossler, with translated English titles, and locality of manufacture.

BATH PREPARATIONS.

Radium lösung für Bäder—(Radium solution for Baths)—Amsterdam, Holland.

Agua Radiogeni pro balnea—Charlottenburg, Prussia.

Badpräparat Radium R.-E.—(Bath Preparation Radium R.-E.)—Neulengbach, Germany.

Emanosal Badetafeln—(Emanosal Bath Tablets)—Höchst a. M., Germany.

Radium-Keil-Badetabletten — (Radium-Keil-Bath Tablets) — Dresden, Saxony.

Radiozon-Badecapsel—(Radiozon-Bath Capsule)—Berlin, Prussia.

Radosol—(Addition to a sitting bath)—Vienna, Austria.

BEVERAGES.

Radium-Emanations-Trinkkur—(Drink-cure)—Amsterdam, Holland.

Radiogen-Wasser—(Radiogen Water)—Charlottenburg, Prussia.

R. E. Trinkpräparat—(R. E. Drink Preparation)—Neulengbach, Germany.

Radium-Keil-Tabletten—(Tablets)—Dresden, Saxony.

PREPARATIONS FOR INJECTION.

Radium-Injectionen Allradium—Amsterdam, Holland.

Sterile Radiogen-Injectionen—Charlottenburg, Prussia.

Radium-Keil-Ampullen—Dresden, Saxony.

Radiogenol zur Injection—Charlottenburg, Prussia.

Dioradin—(pro tuberculose)—Neuilly-Paris, France.

RADIO-ACTIVE MUD AND COMPRESSES.

Radiumschlamm—(Radium mud)—Amsterdam, Holland.

Radium-Kompresse—(Radium-compress)—Amsterdam, Holland.

Radium Dauerkompresse—(Durable compress)—Kreuznach, Prussia.

Radium-Emanations-Ledersäckchen—(Leather-pouch)—Kamnitz, Bohemia.

Ledersäckchen—(Leather-pouch)—St. Joachimsthal, Austria.

RADIO-ACTIVE EMBROCATIONS AND COSMETICS.

Radium-Keil-Essenz—Dresden, Saxony.

Radiospirit—(Radio spirit)—Marienbad, Bohemia.

Radio-Gelatine—Kreuznach, Prussia.

Unguentum Radioli—Kreuznach, Prussia.

Radium-Massage creme—Dresden, Saxony.

St. Joachimsthaler Radiumseife—(Radium Soap)—St. Joachimsthal, Austria.

Simson-Haarwasser—(Hair water)—Berlin, Prussia.

RADIO-ACTIVE CARBON.

Radium-Carbonpulver—(Powder)—Berlin, Prussia.

Radium-Carbon-Präparate—Berlin, Prussia.

INTERNAL RADIUM PREPARATIONS.

Radiopyrin—Berlin, Prussia.

Radiocitin—Berlin, Prussia.

—Pharm. Ztg., lvii (1912), No. 43, 432-433.

COBALT.

Cobaltinitrites—A Study of and their Application to Analytical Chemistry.—L. L. Burgess and Oliver Kann, University of Illinois, state that the precipitation of potassium as the cobaltinitrite is rendered much more delicate by the presence of silver nitrate, the silver replacing the sodium in the sodium-potassium derivative, forming a much less soluble compound.

One drop of a 25 per cent. solution of pure sodium cobaltinitrite, $\text{Na}_3(\text{NO}_2)_6$, produces no precipitate in a solution containing less than 100 parts K per million, while in the presence of $1/10 \text{ AgNO}_3$ a distinct precipitate is produced in a dilution of 1 part K per million.

Ammonia, Cæsium, Rubidium, and Thallium combine with silver to form less soluble salts than the simple salts.

Lead and mercurous mercury also have the property of decreasing the solubility of the alkali cobaltinitrites.—J Am. Chem. Soc., May, 1912, Vol. 34, p. 652. (L. A. B.)

LEAD.

Lead—Determination in Chemicals.—G. D. Elidon directs attention to certain difficulties encountered in carrying out Warrington's colorimetric test for lead and describes two processes which he has found satisfactory in the determination of lead in chemicals, either of which is reliable:

1. The required quantity of the chemical is dissolved in water, the solution filtered through an 11.0 Cm. filter-paper, and the lead estimated in the filtrate in the usual manner. The filter-paper is then washed with five successive quantities of 10 Cc. of 0.6 per cent. acetic acid, the washings being mixed. The lead is then estimated in these washings by adding 3 Cc. of saturated sulphuretted-hydrogen water, and comparing the color produced with standards (made with 0.6 per cent. acetic acid) containing known amounts of lead. It is important that the comparisons be made with standards containing the same strength acid as that used for the washings. The lead so found added to the lead found in the original filtrate will give the total lead in the chemical.

2. The chemical is dissolved in water and 0.5 Cc. of 60 per cent. acetic acid added for every 50 Cc. of the solution; the solution is then filtered. The filtered solution is then made alkaline with ammonia, and the lead estimated as usual.—Trans. Brit. Pharm. Conf. (Yearbook of Pharm.), 1912, 501-503.

Lead Poisoning.—Hamilton, Alice, in a discussion of industrial lead-poisoning in the light of recent studies, asserts that this is a disease with which the ordinary practitioner has very little familiarity. Plumbism is fairly common in industrial centers and not only causes permanent disability or death, but also decidedly influences the course of other diseases. Its importance is undeniable and the reason why it has escaped careful study is not apparent. Weyl's lead tabes is far from being a rare condition in this country, and instances of it can be found in every town where there are lead industries of a dangerous character.—J. Am. M. Assoc., 1912, v 59, pp. 777-782. (M. I. W.)

THORIUM.

Thorium—New Method for its Separation and Estimation.—T. O. Smith and C. James have observed that thorium may be separated quantitatively from the rare earths by means of sebacic acid.

Thorium sebacate is a voluminous, granular precipitate which settles readily and is easily filtered.

The thorium solution should be neutral, and hot, and a slight excess of a hot solution of sebacic acid added slowly with continuous stirring. The precipitate which forms at once is immediately filtered and thoroughly washed with boiling water. The sebacate washes readily and the operation may be performed with ease in a very short time. The precipitate is rapidly dried, ignited, and weighed as thorium dioxide.

The results given show close agreement with that obtained by the use of oxalic acid, and the presence of cerium, lanthanum, praseodymium, neodymium, and traces of samarium, gadolinium, etc., did not seem to effect the accuracy of the separation.

Sebacic acid may be prepared by heating castor oil soap with sodium hydroxide, and is very sparingly soluble in cold water, but fairly soluble in boiling water.—Jour. Am. Chem. Soc., March, 1912, Vol. 34, p. 281. (L. A. B.)

MERCURY.

Mercury—Improved Purification by Oxidation.—W. R. Forbes observes that small quantities of mercury are conveniently purified by streaming through nitric acid and mercurous nitrate, and that large quantities are purified by oxidation. Air is drawn through the metal, and the zinc and lead thus oxidized rise to the surface as a scum. The defect of this method lies in the fact that it is liable to leave a somewhat large proportion of metal unacted on.

An improved method is to first oxidize with air and then to shake with a quantity of charcoal powder which has been allowed to absorb a large amount of oxygen. This will materially improve the oxidation, and the charcoal will rise to the surface and carry the scum with it.—Chem. News, Aug 16, 1912, 74.

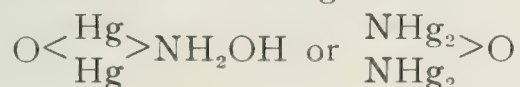
Mercury—Volumetric Determination with Arsenous Acid.—Dr. F. Litterscheid finds that if a solution of arsenous acid in bicarbonate alkaline solution is added in excess to a solution of a mercuric salt containing small quantities of acid or of sodium bicarbonate, and the mixture is shaken, a white precipitate is formed which gradually changes to sulphur yellow, and if then heated in presence of a sufficient quantity of sodium bicarbonate is completely reduced to metallic mercury, a corresponding quantity of arsenous acid being converted into arsenic acid. The reaction is quantitative, 1 mol. arsenous acid reducing 2 mol. of the mercuric salt as follows: $\text{As}_2\text{O}_3 + 2\text{HgCl}_2 + 8\text{NaHCO}_3 = 2\text{Hg} + 4\text{NaCl} + 8\text{CO}_2 + 2\text{Na}_2\text{HAsO}_4 + 3\text{H}_2\text{O}$. One cubic centimeter of 1/10 N. arsenous acid solution corresponds to 0.01003 Gm. mercury (=0.013575 Gm. mercuric chloride). The quantity of arsenous acid consumed is ascertained by titrating the excess with iodine solution in the usual manner, but the solution requires filtration before the titration.—Pharm. Ztg., lvii (1912), No. 47, 472; from Chem. Ztg., 1912, No. 65.

Mercury—Determination in Ointments and Plasters.—R. Weinland and Fr. Ensgraber recommend the following method for the determination of mercury in ointments, which differs from the method directed in the G. P. V in some important particulars: 1.0 Gm. of the ointment is accurately weighed on a small piece of parchment paper, this is placed into a separatory funnel and shaken with a mixture of 30 Cc. each of ether and benzin until the fat is completely dissolved; then 100 Cc. of strong chlorine water and 50 Cc. of diluted hydrochloric acid are added, and the mixture is shaken until all the mercury is dissolved. The aqueous solution is run off into a beaker, the residual ether-benzin-fat solution is washed twice with 50 Cc. of acidulated (HCl) water, and the aqueous solution of mercuric chloride, with the washings, is heated to eliminate the excess of chlorine. The mercury is then determined in the usual manner as sulphide.—Pharm. Ztg., lvii (1912), No. 55, 554; from Südd. Apoth. Ztg., 1912, No. 53.

Mercuric Chloride—Its Detection in Calomel.—E. Wollschläger makes use of the phenomena that a solution of HCN colors pure HgCl grey, but does not change HgCl₂. Should calomel be contaminated with bichloride then the appearance of the grey color will be retarded according to the amount present. The following explanation is given: HCN at first reacts with HgCl₂, producing a white compound $\text{HgCl}_2 + 2\text{HgCl} + \text{HCN} = \text{HgCl} \cdot \text{CN} + 2\text{HgCl} + \text{HCl}$. After this HCN attacks the calomel reducing same to metallic mercury and producing the grey color. $\text{HgCl}_2 + 2\text{HgCl} + 2\text{HCN} = 2\text{HgCl} \cdot \text{CN} + \text{Hg} + \text{HCl}$. It is necessary to employ a weak solution HCN, f. i. the official Bitter Almond Water, containing 1 per mille. The author found that 0.1 Gm. calomel containing 1 per cent. of bichloride will assume a grey color after adding seven drops of bitter almond water. The same amount of bichloride containing 1 per cent. of calomal require 65 drops.—Ph. Ztg., 1912, No. 78, 786. (O. R.)

Calomel—Presence in Mercuric Chloride.—In the preparation of Nessler's solution, F. H. Alcock observed that the HgCl₂ did not completely dissolve, but left about 0.75 per cent. of crystalline residue, which proved to be calomel. He recommends that provisions should be made in the new B. P. for the absence of calomel in bichloride, just as for the absence of the higher salt in the lower salt in the present revision.—Ch. & Dr., 1912, 821. (O. R.)

Mercury Oxy-cyanide—Decomposition with Acids, etc.—Rupp and Goy continue their work on this substance describing results of its decomposition with acids and with ammonium compounds. They find that diluted sulphuric acid gives a cyanide sulphate $\text{Hg}(\text{CN})_2 \cdot \text{HgSO}_4 \cdot 5\text{H}_2\text{O}$; that nitric acid yields a cyanide nitrate, $\text{Hg}(\text{CN})_2 \cdot \text{Hg}(\text{NO}_3)_2$; that glacial acetic acid, anhydrous formic acid, anhydrous oxalic acid, alcoholic succinic acid solution, and alcoholic benzoic acid solutions produce corresponding double salts, having the composition $\text{Hg}(\text{CN})_2 \cdot \text{Hg}(\text{C}_2\text{H}_3\text{O}_2)_2$, $\text{Hg}(\text{CN})_2 \cdot \text{Hg}_2(\text{CHO}_2)_2$, $\text{Hg}(\text{CN})_2 \cdot \text{HgC}_2\text{O}_4$, $\text{Hg}(\text{CN})_2 \cdot \text{HgC}_4\text{H}_4\text{O}_4 \cdot 2\text{H}_2\text{O}$ and $\text{Hg}(\text{CN})_2 \cdot \text{Hg}(\text{C}_7\text{H}_5\text{O}_2)_2 \cdot \text{H}_2\text{O}$, respectively. All these they isolated, purified and submitted to ultimate analysis. The compounds formed with ammonia and with ammonium salts are apparently quite complex, that with ammonium chloride seeming to be either



These derivatives suggest that mercury oxy-cyanide is $\text{O} < \begin{array}{c} \text{HgCN} \\ \text{HgCN} \end{array}$
—Arch. d. Pharm., 250 (1912), No. 4, 280. (H. V. A.)

Brieger therefore concludes that a modification of the official assay is essential and suggests the following: Dissolve 0.5 Gm. in 30 Cc. N/10 KOH, dilute with 100 Cc. water, add few drops o-nitrophenol solution as indicator, then add 30 Cc. N/10 HCl and titrate with N/10 KOH to yellow color. Multiply the extra cubic centimeters of N/10 KOH by 0.0138 and thus deduce the weight of salicylato-salicylic acid. Subtract percentage of salicylato-salicylic acid from 100 and obtain percentage of true mercuric salicylate in the product. Multiply the latter figure by 0.5952 to calculate the percentage of mercury. Verify this mercury figure by the following assay. Dissolve 0.3 Gm. substance in 10 Cc. nKOH, add 25 Cc. water and 5 Cc. 30 per cent. acetic acid, then add 25 Cc. iodine V. S. After 15 hours titrate with N/10 Thio-sulphate V. S. The paper closes with a note correcting the wording of the German Pharmacopœia on sublimate pastilles.—Arch. d. Pharm., 250 (1912), No. 1, 62. (H. V. A.)

ARSENIC.

Arsenic—Quantitative Estimation.—Rupp and Lehmann find the accepted arsenical assays do not give exact results, when minute quantities of arsenic are to be determined in animal tissue; for instance in problems involving the fate of salvarsan in the animal body. They find the Schneider-Fyfe-Beckurts method of assay the most feasible and have corrected its defects, formulating the following method of manipulation.

The flesh mass (20 Gm.) is rubbed in porcelain dish with pulverized potassium permanganate (10 Gm.) and then diluted sulphuric acid (10 Cc.) is gradually added, whereupon a more or less dry pulverulent mass remains. To this is added little by little 25 Cc. concentrated sulphuric acid with stirring until practically all the flesh is dissolved. A yellow to brown liquid is obtained, whereupon hydrogen dioxide solution (30 Cc. 3 per cent. H_2O_2) is added. After effervescence ceases, the liquid is transferred to a Kjeldahl distilling flask, the dish being rinsed with 30 Cc. concentrated sulphuric acid, which also goes into the flask. To the fluid in the flask is added 10 Gm. crystallized ferrous sulphate and after cooling the mixture, 50 Gm. sodium chloride is added and the mixture is distilled on a sandbath, the distillate being collected in an Erlenmeyer flask containing 40 Gm. sodium bicarbonate and 100 Cc. water. When distillation is complete, if the distillate is acid, it is made alkaline with more bicarbonate and then titrated (preferably

after filtration) with deci-normal or centi-normal thiosulphate V. S., starch paste being used as an indicator.

An important part of the research was the study of the possible loss of arsenic in the distillate and this the writers found a constant factor, averaging 0.5 Cc. centi-normal iodine V. S., which should be added to actual amount of iodine V. S. used.

The writers find oxidation of the flesh with potassium persulphate instead of permanganate gives good results and details of manipulation are given in the paper. They prefer, however, the permanganate method.—Arch. d. Pharm., 250 (1912), No. 5, 382. (H. V. A.)

Arsenic—Detection of the Smallest Quantities.—O. Billeter and Bolyghin recommend for the detection of the smallest quantities of arsenic that the hydrochloric acid distillates, obtained in the ordinary analytical course, be treated with a current of chlorine monoxide, whereby the hydrochloric acid present is destroyed. The residue of evaporation of the aqueous solution then contains pure arsenic acid, which is then detected in the usual way in Marsh's apparatus, using electrolytic zinc.—Pharm. Ztg., lvii (1912), No. 38, 382; from Chem. Ztg., 1912, No. 44, 402.

Arsenic Test, B. P.—Proposed Description.—The Pharmacopœia Committee of the General Medical Council has issued a supplementary report (of 36 octavo pages) of the Committee of Reference in Pharmacy on the most suitable limit-test for arsenic in official substances and preparations and the limits for arsenic that may reasonably be adopted by the British Pharmacopœia. The report has been prepared by Mr. C. A. Hill and contains a sketch of the apparatus to be employed and illustrated in the Pharmacopœia, which Mr. Hill and H. S. Collins published in 1905 in a paper on an effective method of applying the "Gutzeit" test for arsenic, and which is shown in "Proceedings" 1906, on p. 849. The report, which is given in comprehensive abstract, gives a description of the apparatus, of the reagents necessary for carrying out the various operations, and the method of performing the quantitative test for arsenic, and concludes with a long list of official articles giving the maximum amount of articles permitted in each, in *parts per million*.—Chem. & Drugg., July 27, 1912, 122-123.

Arsenic—Presence in Dietetic Vegetables.—F. Jadin and A. Astruc have investigated the distribution of arsenium in dietetic vegetables in common use. It is found to be practically universally present in minute quantity. It is probably the source of the

arsenium found by Gautier, Bertrand, and other investigators in the animal body. In the thirty-six kinds of vegetable foods enumerated leeks were found to contain the least, 0.003 Mgm. in 100 Gm. and split peas the most with 0.026 Mgm. Black truffles give 0.020 Mgm., but mushrooms only 0.006 Mgm. Among vegetables spinach contained most, 0.023 Mgm.; green peas gave but 0.004 Mgm. Nuts from Lozère gave 0.011 Mgm., and almonds 0.025 Mgm. Chestnuts contained 0.005 Mgm., apples 0.05 Mgm., pineapple from Azores 0.008 Mgm., and bananas 0.006 Mgm. Other fruits and vegetables showed amounts varying between these limits.—Pharm. Journ. and Pharmacist, April 27, 1912, 537; from Compt. rend., 154 (1912), 893.

Arsenic Antidote.—Mr. Otto Raubenheimer suggests that Magma Magnesia N. F. is much better for preparation of arsenical antidote than is the magnesium oxide of the present official formula. He recommends that 300 Cc. of milk of magnesia be diluted with 300 Cc. of water and this mixture placed in a bottle holding about 1 liter; 40 Cc. Liquor Ferri Tersulphatis diluted with 260 Cc. of water to be placed in another bottle. When the antidote is required add the iron solution gradually to the magnesia mixture, shake well and the preparation is ready for instant administration. He claims for the preparation the following advantages:

1. The finely suspended magnesium hydroxide in the milk of magnesia forms a smooth and finely divided magma of ferric hydroxide.

2. Such a magma unquestionably has therapeutic advantages in combining more readily with the arsenic.

3. By pouring the iron solution into the diluted milk of magnesia a more voluminous magma will be obtained than by the reverse as directed in the U. S. P.

4. Milk of Magnesia, if properly prepared, is practically free from carbonate, while magnesium oxide always contains some carbonate, except when recently calcined.

In conclusion, he begs pharmacists to keep these two solutions on hand, side by side, ready for immediate use.—Proc. N. Y. Pharm. Assoc., 1912, pp. 321-324. (E. C. M.)

Arsenous Acid—Atmospheric Oxidation of its Solutions.—The contradictory statements regarding the oxidation or not of solutions of arsenous acid when heated in the air or on prolonged exposure, has led F. Reinthaler to make experiments in order to conclusively determine the question in controversy. The purest arsenous oxide

obtainable was recrystallized from hot strong hydrochloric acid and twice resublimed; the caustic soda used to dissolve it was made from metallic sodium and twice purified by melting; it was then taken up in absolute alcohol, and the latter replaced by water at water-bath heat. So prepared, the caustic soda contained no impurity but a little carbonate, and after dissolving the molecular quantity of arsenous oxide in it and saturating the solution with carbon dioxide, it was adjusted to N/10 strength. Portions of this solution were heated in different vessels and for different lengths of time. In every case the titration value of the solution (against iodine) was found to be diminished, the oxidation for 10 Cc. varying from 0.027 Cc. per hour in a flask to 0.35 Cc. per hour in a platinum dish, showing that atmospheric oxidation is by no means a negligible factor when the solution is heated. On the other hand, no alteration of the titration value was found when the solution was kept for four months at the ordinary temperature.—Pharm. Journ. and Pharmacist, Oct. 12, 1912, 455; from Chem. Ztg., June 25, 1912, 713.

ANTIMONY.

Antimony—Relation of Chemical Constitution and Pharmacologic Action in Antimony Preparations.—Otto Brunner, Zürich, through numerous experiments classifies the antimony preparations into two groups, the dose as an emetic, in fact the entire toxicity of one group being ten times larger than of the other group. This seems to depend upon the valency of the antimony, which in the toxic preparations is 3 and in the weak preparations is 5.—Arch. exp. Path. & Ph., 1912, 68, 186. (O. R.)

Antimony—New Antidote in Potassium Hexatantalate.—The present antidote, i. e., tannic acid, is only effective when in direct contact, but not after antimony has been absorbed. Potassium Hexatantalate, manufactured by Siemens & Halski, Berlin, acts as an antidote even if antimony has been taken up by the circulation. It has also been found of value as an antidote for sublimate, potassium chlorate, lead acetate, arsacetin, dioxydiamidoarsenobenzol, strychnine, morphine, quinine and cocaine.—Arch. exp. Path. & Ph., 1912, 68, 275. (O. R.)

Kermes Mineral—Excessive Stringency of the Test of the French Pharmacopœia.—Galois observes that the "Codex" gives very stringent tests for the presence of antimony sulphide, iron, sodium thiosulphate and other impurities, but gives no indication how these may be avoided. The author has examined a specimen of kermes

prepared by himself and eight commercial samples obtained from dealers of repute. In no case did the preparation meet the official requirements. All contained the above-mentioned impurities. As in so many other instances the French official requirements for this complex substance are considered to be so stringent as to be of little practical value.—Pharm. Journ. and Pharmacist, May 18, 1912; 647; from Journ. de Pharm. et Chim., 1912, 431.

BISMUTH.

Bismuth Carbonate.—*Commercial Quality and Improved Test for the Presence of Nitrates.*—Walter Ryley Pratt has found a modification of the Sprengel process for determining nitrates in water to be well adapted and quite reliable for the estimation of nitrates in commercial bismuth carbonate. The method depends on the color reaction produced by sodium or ammonium nitrate with phenol-disulphonic acid in presence of sulphuric acid, due to the formation of a derivative nitrophenol, and is equally effective for the quantitative estimation of soluble nitrate and of insoluble nitrate. The phenol-disulphonic acid used for the colorimetric assay was prepared by heating 3 Gm. of pure phenol with 20 Cc. of pure concentrated H_2SO_4 on a water bath for six hours. The standard nitrate solution contained 0.7215 Gm. pure potassium nitrate per liter (1 Cc.=1/10 Mgm. nitrogen), and with these reagents a series of shades were prepared from solutions containing, respectively 1/100, 1/75, 1/50 Mgm. of nitrogen. The samples of bismuth carbonate were then tested as follows: The bismuth carbonate was thoroughly triturated to break down aggregated masses, and 0.02 gram treated directly with the phenol-disulphonic acid. On the addition of ammonia, the bismuth was precipitated and filtered off. The filter-paper was washed with about 50 Cc. of distilled water, the color being easily washed away from the precipitate. The filtrate was made up to 100 Cc. in a Nessler cylinder and compared with the standard shades. Using a dilution of approximately 1/100 to 1/50 Mgm. of nitrogen it was found that the shades could be easily and accurately matched. The amount of nitrogen present, expressed in milligrams, multiplied by the factor 102.14 gives the percentage of bismuth subnitrate present (calculating the total nitrate as BiONO_3). If the factor 19.29 is used, the result gives the percentage of nitrate as N_2O_5 .

Of seventeen samples of bismuth carbonate examined only one showed a total absence of nitrates, two showed traces, while the others showed quantities varying from 1.15 to 3.27 per cent., though

only two of them exceeded 1.97 per cent. The author considers his research shows that a limit of 2 per cent. of total nitrate, calculated as BiONO_3 , is generous, and that it can be readily and satisfactorily determined by the color-test modified as described. It seems curious that so many of the samples should contain sulphate, which no doubt comes from the sodium carbonate used in the manufacture. He states that more complete washing would be a decided advantage, and that it would be advisable to insist on a limit of alkalinity, as one or two of the samples examined were decidedly impure in that respect.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1912, 506, 513.

VANADIUM.

Vanadium Compounds—Review with Particular Reference to Their Therapeutic Use.—The numerous chemical investigations of vanadium and its compounds that are referred to in the "Report" of 1911 are not alone interesting from the chemical and technical standpoint, but are reflected also in the domain of medicine by the pharmacological investigations that have been made in recent years in the search for vanadium compounds suitable for therapeutic exhibition. Dr. Felix von Oefele and Dr. J. Bullinger, in view of the prospective importance of the metal, its alloys, and saline compounds, have now contributed an interesting review of our present knowledge of these compounds, with particular reflection upon those which have found therapeutic use. They speak of the occurrence of vanadium in nature, mention some of the uses of its alloys in technical medicine—such for example as the gold and platinum alloys of vanadium in dentistry—and then proceed to the description of a number of inorganic compounds of the metal which have been favorably mentioned as therapeutic medicaments; such, for example, as the several different modifications of vanadium pentoxide (V_2O_5), the different salts of orthovanadic acid (H_3VO_3), vanadium dichloride and its double salts with ammonium chloride and sodium chloride, respectively, which are characterized by great stability, and have on this account been exploited for a number of years past as specialties under specific trade names. Other compounds that are promising are the iodides and oxyiodides of vanadium, vanadium trisulphide, and vanadium selenide. Interesting compounds also, although no pharmacological experiments have yet been made with them, are the vanadium sulphvanadates and vanadium oxysulphvanadates, and the vanadium sulphates.—Pharm. Zentralh., liii (1912), No. 1, 1-9.

Vanadic Acid—Reduction by Hydrogen Peroxide and by Persulphates.—According to J. R. Cain and J. C. Hostetter, pentavalent vanadium can be immediately and quantitatively reduced to the quadrivalent condition by means of hydrogen peroxide or the peroxides of zinc, barium, magnesium or sodium, in the presence of concentrated sulphuric acid. Molybdenum, titanium or iron do not interfere.

It was also found that concentrated sulphuric acid solutions of vanadium pentoxide could be reduced with persulphates. The process is carried out by evaporating a solution of vanadium with concentrated sulphuric acid until fumes are given off freely, cool, add a slight excess of 3 per cent H_2O_2 , cover the flask and fume strongly for a few minutes more to destroy the excess of peroxide, after which the solution may be titrated against permanganate.—*Jour. Am. Chem. Soc.*, March, 1912, vol. 34, page 274. (L. A. B.)

SILVER.

Argentum Colloidale, G. P. V.—Unsatisfactory Definition.—Erich Harnack directs attention to the unsatisfactory description of argentum colloidale in the monogram of the G. P. V. The failure to describe its solubility and to prescribe the minimum content of silver in the preparation, leads to the supply of preparations of variable value and composition, which, although complying with the pharmacopœial requirements in other respects may be of inferior therapeutic activity. The pharmacopœia commission should give a definite description of colloidal silver in conformity with a type selected from the preparations that have proven satisfactory, defining its properties, methods of examination, determination of silver content, its relation and action towards dilute and concentrated electrolytes, etc. The author mentions "collargol" as being a suitable type for this purpose.—*Pharm. Ztg.*, lvii (1912), No. 45, 453; from *D. Med. Wschr.*, 1912, No. 17.

Silver Oxybromide—Preparation and Properties.—A. Seyewetz finds that when an aqueous solution of quinone in presence of potassium bromide acts in the cold on very finely divided silver, a new silver compound is obtained, of a composition corresponding to that of an oxybromide of the formula $\text{Ag}_5\text{Br}_7\cdot\text{Ag}_2\text{O}_7$. The oxybromide is a reddish-brown, amorphous powder which may be crystallized from ammonia. It is insoluble in water and in nitric acid, and is reduced by a current of hydrogen, yielding metallic silver. When heated to a red heat it yields silver bromide.

Silver Oxyiodide is obtained if potassium iodide is substituted for the bromide in the above reaction.—Chem. News, March 22, 1912, 143; from Compt. rend., 154 (1912), No. 6.

GOLD.

Gold—Titanium Trichloride a Sensitive Test.—Stachler finds that an aqueous solution of titanium trichloride affords an extremely delicate test for gold. If a few drops of a dilute solution containing gold chloride be added to this, the intense violet color of colloidal gold will be evident, due to adsorption to the titanous acid. On boiling, a bulky dark-blue precipitate is formed, insoluble in ammonia. It is stated that a dilution of gold, 1 in 20,000,000 may be thus detected.—Pharm. Journ. and Pharmacist, June 1, 1912, 721; from Berichte, 44, 2914.

Gold Salts—Sensitive Reaction.—J. A. Slemssen states that if a 0.5 per cent. solution of gold chloride and a 0.5 per cent. solution of meta-phenylene-diamine sulphate are mixed, a yellow to dark brown color is produced, probably from reduction to colloidal gold; but if the gold chloride solution is previously diluted with 100 times its volume of water, the addition of the diamine produces a violet color. The sensitiveness of this reaction is greater than that of any previously known test for gold.—Pharm. Journ. and Pharmacist, Oct. 5, 1912, 421; from Chem. Ztg., Aug. 13, 1912, 934.

PLATINUM.

Platinum—Complex Compounds with Organic Selenides.—E. Fritzmann finds that when aqueous solution of potassium platino-chloride is shaken with organic selenides until decolorization occurs, double platinum compounds, of the generic formula $\text{PtCl}_2 \cdot 2\text{SeR}_2$, are formed. As a rule these occur in two forms, which show marked differences from one another. The isomeric β -forms are generally lighter in color, and less soluble. Compounds of this class with methyl, ethyl, and propyl selenides have been prepared having the respective formulæ $\text{PtCl}_2 \cdot 2(\text{CH}_3)_2\text{Se}$, $\text{PtCl}_2 \cdot 2(\text{C}_2\text{H}_5)_2\text{Se}$ and $\text{PtCl}_2 \cdot 2(\text{C}_3\text{H}_7)_2\text{Se}$. The α -form of the ethyl compound occurs in yellowish-red prismatic needles melting at 55°C . The β -form occurs in pale yellow prisms or tablets melting at 73°C .—Pharm. Journ. and Pharmacist, Feb. 24, 1912, 249; from Ztschr. Anorgan. Chem. 73, 239.

Platinum and Aluminum—Formation of Alloys.—According to Chouriguine, platinum and aluminum readily form a series of alloys, which on micrographic examination are seen to contain little lamellae

of eutectic containing crystals of aluminum and the compound PtAl_3 . The alloy corresponding to 70.4 per cent. of the platinum is perfectly homogeneous, and its formula is PtAl_3 . This compound is unaltered in air, and does not dissolve in ordinary acids in the cold.—Chem. News, Aug. 30, 1912, 108; from Compt. rend., 155 (1912), No. 2.

ORGANIC CHEMISTRY

HYDROCARBONS

(Including Volatile Oils and Derivatives.)

Benzin and Kerosene—Differentiation.—Prof. Dr. Holde and Dr. Ubbelohde, two authorities in petroleum chemistry, consider the flash point as the most important for the differentiation between benzin and kerosene. Great confusion seems to exist, quite especially as of late a great many fractional distillates have come into the market. The authors consider that the product having a flash point above 21°C . should be named kerosene or petroleum.—Ph. Zhalle., 1912, No. 50, 1429. (O. R.)

Petroleum Benzin—Objection to the Definition of the G. P. V.—R. Goerlich, comparing the requirements of the G. P. V for "Benzinum petrolei" with those of G. P. I, III and IV, points out that the definition of the G. P. V must be regarded as retrogressive rather than progressive. It is possible that in this definition the commission has taken into consideration existing conditions of supply, but, as a matter of fact, petroleum benzin conforming to the present definition is unsuitable for analytical purposes, whereas the former definition—a distillate passing between 50° (or 60°) and 75° and having a corresponding specific gravity of 0.640-0.670—secured a product suitable for analytical as well as pharmaceutical purposes in general. A return to the older definitions is therefore desirable, and the author recommends that the pharmacopœial monograph should define petroleum benzin as consisting of "the portions of petroleum boiling at from 60° to 75° and having the specific gravity of 0.650-0.670."—Pharm. Ztg., lvii (1912), No. 44, 441-442.

Petroleum Spirit—Commercial Variability.—Thomas Tyrer and F. C. Gosling call attention to the variability of petroleum spirit in commerce. The gravities and boiling-points are not coincident. One finds the specific gravity, 640 to 700; boiling point, 40° to 60°C . These figures are not obtainable in practice. A petroleum

spirit of sp. gr. 0.40 has always a large fraction boiling below 40°, and a spirit of sp. gr. 700 always contains a large amount distilling above 60° C.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1912, 433.

Ichthyol and its Substitutes.—Beckurts and Frerichs discuss identification of ichthyol and its differentiation from its substitutes, showing as data essential to intelligent comparison (1) residue on drying, (2) total sulphur, (3) sulphur as sulphate, (4) S. as sulphones, (5) S. as sulphides, (6) total ammonia, (7) ammonium sulphate, (8) ash. They give resume of previous work on the subject, details of analysis as outlined above and reports of analysis of all available ichthyol derivatives. They find ichthyol of fairly uniform composition, much more so than its substitutes, which in turn are in some cases quite different in composition than ichthyol.—Arch. d. Pharm., 250 (1912), Nos. 6 and 7, 478 and 481. (H. V. A.)

Ichthyol and Ichthynat—Composition.—In 1909 Dr. F. W. Passmore stated that the combined sulphur is the most important constituent of the organic sulphur preparations of the ichthyol type, and he gave analytical figures which show ichthyol is distinguished from its substitutes by containing 12.5 per cent. of "sulphidic" sulphur in the organic dry residue, and 6.1 per cent. of "sulphonic" sulphur, while the composition as a whole is remarkably constant.

His conclusions have now been generally confirmed by Dr. Aufrecht, who gives analyses of ichthyol and ichthynat, showing that the substances, when dried, had the following composition:

	Ichthynat	Ichthyol
"Sulphidic" sulphur.....	5.70%	13.99%
"Sulphonic" sulphur.....	6.59%	5.60%
Total sulphur.....	12.20%	19.59%
Ammonia	3.50%	2.98%
Ethereal extract.....	14.55%	31.08%
Substances insoluble in alcohol.....	12.99%	44.15%

The ammonium sulphate in the residue was not estimated. The ichthyol and ichthynat in their natural state contained 10.6 and 7.3 per cent. of sulphur respectively.—Amer. Journ. Pharm., Nov., 1912, 530; from Allgem. Mediz. Central-Ztg., 1912, 69.

Coal Tar Products—Importance in the Drug Trade.—Charles B. Kelsey says that coal tar is one of the three residuals of most importance in the manufacture of coal gas, about twelve gallons of this product being obtained from every ton of coal carbonized. The utilization of coal tar products as applied to the manufacture

of dyes and medicinal preparations, is monopolized by the German laboratories on account of the great difference in wages received by the chemists of that country compared with those of America. Only two of the so-called coal tar products handled by druggists occur naturally in coal tar—Naphthaline and the various grades of Carbolic Acid. Naphthaline is mostly known to druggists as Moth Balls, Moth Flakes, etc. The druggists of the United States handle about 5,000,000 pounds a year of this substance as moth preventives. Its effectiveness for this purpose depends upon the distaste which the flying moth has for its odor.

The other natural derivative handled by druggists is Carbolic Acid, under the names of Phenol U. S. P. and Cresol U. S. P. Both of these are known as Carbolic Acid, one termed crystallized, and the other carbolic acid for disinfecting purposes. The latter is not always U. S. P. Cresol, as a less highly refined grade is as satisfactory for this purpose.—Proc. Idaho Pharm. Assoc., 1912, pp. 10-12. (E. C. M.)

Coal Tar Products—Manufacture.—George McDermid, the chemist of the tar department, Denver Gas and Electric Light Co., furnishes an interesting paper on coal tar products, giving their methods of manufacture, uses, etc., avoiding the use of technical terms as far as possible, so as to make it intelligible to the average pharmacist.—Proc. Idaho Pharm. Assoc., 1912, pp. 36-40. (E. C. M.)

Rubicene—A New Red Hydrocarbon.—Although the presence of a red substance was noted many years ago by Fittig among the decomposition products obtained by distilling diphenic acid with quicklime, R. Pommerer observes that while it has attracted some attention from other workers, it does not appear to have been thoroughly investigated. The author names this substance, $C_{26}H_{14}$, rubicene. It forms a brilliant red, micro-crystalline powder, strongly electrical when rubbed, sparingly soluble in hot benzene, from which it separates on cooling in fine lancet-shaped crystals, melting at 306° C. Insoluble in petroleum ether and in cold alcohol; almost insoluble in ether. It may be crystallized from solution in chloroform or from nitrobenzene.—Pharm. Journ. and Pharmacist, April 13, 1912, 485; from Berichte, 48 (1912), 294.

Retene Derivatives.—Heiduschka and Grimm report continuation of their work in retene, that methyl-ethyl-phenanthrene found in coal-tar. This time they have directed their efforts toward condensing the di-ketone of retene $C_{16}HCO_{16}CO$ (retene quinone) with

organo-magnesium halogen compounds and subsequent formation of a line of diatomic alcohols of the pinacolin type. They have prepared and analyzed dioxydiphenyldihydroretene $C_{30}H_{28}O_2$; the anhydride of the same, $C_{30}H_{26}O$; halogen compounds of the same; diphenylretene $C_{30}H_{26}$; diphenylhexahydroretene $C_{30}H_{32}$; dioxy-p-tolyldihydroretene, $C_{32}H_{32}O_2$; anhydride of the same $C_{32}H_{30}O$; dioxydibenzoyldihydroretene $C_{30}H_{32}O_2$ dioxydinaphthyl-dihydroretene $C_{34}H_{32}O_2$; anhydride of the same, $C_{38}H_{30}O$; dioxydimethyldihydroretene $C_{26}H_{24}O_2$; and lastly a nonochloride of retene $C_{14}H_{14}Cl_9$.—Arch. d. Pharm., 250 (1912), No. 1, 33. (H. V. A.)

VOLATILE OILS.

Volatile Oils—Manufacture.—Daniel M. Grosh describes the methods for producing a number of the natural essential oils and some of the synthetic oils.—Bull. Pharm., Aug., 1912, 335-337. (C. M. S.)

Volatile Oils—Variability of Optical Rotation.—Rob. Frey contributes some interesting memoranda concerning the variability of the optical rotation of volatile oils mentioned in the G. P. V. among the constants serving for their valuation. The optical rotation is influenced by a variety of causes, such as the conditions of development of the plant, the method of production, fractionation, age, etc., so that some of the oils may vary within considerable limits from dextro- to lævorotation. In the case of turpentine oils, for example this variation may be from $+15^\circ$ to -40° , a difference of 55° in the specific rotation. An examination of a number of conifer-oils in a 94.7 Mm. tube showed the following average optical rotatory constants: Ol. terebinthin. rectificat., $+2.5^\circ$; Ol. terebinthin. gallic, -5.6° ; Ol. Pini (Kienöl), $+14.9^\circ$; Ol. Pini sil-vertris (pine-needle oil), -19.2° ; Ol. Pini pumilionis, -7.2° . By judicious admixture it becomes quite possible to make an optically inactive product from dextro- and lævo rotatory turpentine oils, or to produce mixtures having the desired intermediate degrees of optical rotation. Again, it has been shown that by fractionation, American turpentine oil will yield fractions having according to the temperature of distillations the specific rotations of $+14.61^\circ$, -0.36° and -13.17° , while similarly French oil of turpentine yields fractions of -42.2° and -18.34° , and the oils from the oleo resins of pine and of fir yield fractions between 155° and 160° , showing the rotation of -20.2° and -7.9° , respectively.—Pharm. Ztg., lvii (1912), No. 78, 785.

Volatile Oils—Effect of Hydrogen Dioxide on Flavor and Taste.

—The chemists of E. Sachsse & Co. report the results of a series of experiments which, in view of the energetic oxidizing action of hydrogen dioxide, were undertaken to determine the effect of the latter on the volatile oils containing easily oxidizable constituents—such as aldehydes, alcohols, etc.—which frequently compose the aromatic flavors of mouth washes containing H_2O_2 . The experiments were carried out by adding to a mixture of 40 Gm. alcohol (90 vol. per cent.), 30 Gm. water, and 25 Gm. hydrogen dioxide, 0.05 Gm. of the volatile oil, and allowing this mixture to stand two months. The *taste* of the mixture was then compared with that of a freshly prepared mixture of identically the same material—no attempt being made to compare the *odor* by reason of the great dilution. The results were as follows:

Unchanged: Anethol, anise oil, star-anise oil, bornyl-acetate, eucalyptol, eucalyptus glob. oil, geranium oil, pine-needle oil, and thymol.

Changed: Taste fainter than fresh—carvacrol, eugenol, clove oil, and terpineol; decidedly changed—geraniol (insipid, musty odor), menthol, menthyl acetate (taste completely destroyed), peppermint oils of all sorts, cinnamic aldehyde (completely oxidized, without a trace of cinnamon odor or taste).—Pharm. Ztg., lvii (1912), No. 4, 34.

Volatile Oils—Extent of their Ability to Dissolve Water.—John C. Umney and Sidney W. Bunker communicates the first of a series of papers dealing with the relations between the chemical nature of the constituents and the *solubility of water in volatile oils*. By this investigation it is hoped that a satisfactory idea will be obtained of the part which moisture plays in the commerce of essential oils, and that many prevalent notions may be, in some cases, corrected, and in others, modified. The oils submitted to examination were classified under types as follows: Terpenes, alcohols, aldehydes, phenols, esters, lactones, and ketones. Many difficulties were encountered during the investigation, notably the estimation of the amount of water which the oils will dissolve, since the quantity dissolved is extremely small, and the time taken to saturate the oil at the ordinary temperature. It is shown that the method of determination in which the difference between the specific gravity of the dry oil and that saturated with water is not delicate enough, but the refracto-meter may be used with success, and the following conclusions are drawn: I. Those essential oils which consist almost en-

tirely of terpenes, of which oils of nutmeg, lemon, etc., are the type, are incapable of dissolving water to any appreciable extent. II. Those essential oils whose chief constituent is an oxygenated body or other terpene derivative dissolve water in general to the extent of about 0.5 per cent.; and in such oils the solubility of water is independent of the chemical nature of the chief constituent. III. Higher solubility is observed in the case of Turkish geranium and Java citronella, but the lactone type, *e. g.*, eucalyptus, and the ketone type, *e. g.*, caraway, appear to be almost incapable of dissolving water. IV. None of the results obtained justify the statement which has been frequently made, and until now accepted as true, that santal oil is capable of dissolving from 1 to 2 per cent. of water, and, in fact, it appears that it must be regarded as possessing a lower solubility than the average.—Pharm. Journ. and Pharmacist, June 1, 1912, 732; from Perfum. and Essential Oil Record, May, 1912.

Oil of Aframomum Angustifolium—A New Volatile Oil.—Schimmel & Co. have distilled from the seed of a species of cardamom indigenous in German East Africa, received from Usambara, a volatile oil in a yield of 4.5 per cent., which proved to be similar in every respect with the oil obtained from Cameroon-cardamoms, derived from *Aframomum Danielli*, K. Schumann, while the cardamoms now under consideration were identified by Schumann as a distinct species, namely *Aframomum Angustifolium*, K. Schum. (N. O. Zingiberaceæ). The new oil was colorless; sp. gr. at 15°, 0.9017; opt. rot., $-16^{\circ} 50'$; refract. index, 1.46911; acid val., 0.4; ester val., 4.2; soluble in 6 vols. and more of 80 per cent. alcohol. Its aroma, however, cannot be compared with that of Ceylon cardamom oil, and owing to its high cineol content it reminds rather of cajaput oil. The quantity of oil at disposal was unfortunately too small to estimate its constitution with any exactitude.—Schimmel's Rep., April, 1912, 136.

Oils of the "Agrumi"—Improved Method of Preparation.—Discussing an improved method proposed by Professors Peretoner and Scarlata of working up lemons, Schimmel & Co., observe that it is common knowledge that the oils of the *agrumi* are prepared by expression from the peel, and that while frequent attempts have been made to find another method of manufacture, so far none of them have met with success. Recently, however, Patante and Carelli have published a report on this new method (in Boll. del Minist. di Agric., Indust. e Commercio, Anno ix, Serie C, Fasc. 9, p. 21) as an essay in the competition for the prizes offered by the *Agrumi*-

industry for the solution of the problem. It consists in cutting up the lemons into small pieces, and pressing them so thoroughly that the juice, in exuding, carries with it the oil which is liberated by the bursting of the cells in the peel. The acid liquid is then subjected to distillation under diminished pressure at a distilling-temperature not exceeding 60° , the still-residue being worked up for lemon-juice. Comparative experiments made by the authors at the Chemico-Pharmaceutical Institute, Palermo, have, however, shown that there is no very marked difference in yield of oil between the proposed method and the older method of hand-pressure, since parallel tests yielded by distillation 0.120 and 0.136 per cent., and by hand-pressure 0.115 and 0.160 per cent. It would seem, therefore, that the only advantage of the new method is expedition and a saving in human labor.

The idea of working at a low temperature and under reduced pressure, however, is regarded by Schimmel & Co. as quite correct, provided there is any gain in yield,; for when the oil evaporates between 50° and 60° , a temperature at which not even the albumen in the cells coagulates, the distillate preserves the pure aroma of the fruit—although there is slight, perceptible difference of aroma in favor of the oil obtained by pressure. With the view of obtaining positive information on the possibility of an increased yield, a large quantity of freshly-gathered lemons were procured for experimentation. The yellow layer of the peel, which contains the volatile oil of the lemon, is removed by peeling. The thin peel is shredded and bruised mechanically as small as possible; the resulting oily paste is liberally diluted with water, and distilled without previous expression, at between 50° and 60° , under 50 to 60 Mm. pressure, until the distillate passed completely free from oil. By this process 0.3 per cent. by weight of oil with a pure odor was obtained, exhibiting in two distillates the following constants: Sp. gr. at 15° , 0.8551 and 0.857; opt. rot., $+55^{\circ} 30'$ and $+56^{\circ} 22'$ (opt. rot. of the initial 10 per cent. of the distillate, $+48^{\circ}$ and $+50^{\circ} 4'$); citral, 3.4 per cent. and 4.5 per cent., respectively.

Omitting further details it may be mentioned that Schimmel & Co. advise the precaution to secure air-tightness of the distilling apparatus, condensers, etc., so as to prevent the air pump from sucking up too much air through the apparatus, this resulting in loss of oil. It is mentioned also that the most favorable temperature of distillation is probably 50° , that it is quite possible that the yield of 0.3 per cent. (which is double that obtainable by hand pressure) may be further increased; and, finally, that the keeping-power of

oils (both of lemon and orange), distilled at about 50°, while less than that of the expressed oil (containing wax), is greater than that of oils distilled under ordinary atmospheric pressure, say at about 100°.—Schimmel's Rep., April, 1912, 70-73.

Ambrette Seed Oil—Properties and Constants.—It is well known that the normal distillate of ambrette seed is of a wax-like consistency, due to the large proportion of highly molecular fatty acids which it contains (principally palmitic acid), and that the liquid oil, from which all odorless admixtures is removed, is obtainable only by special treatment. Schimmel & Co. have determined the constants in both of these.

Normal, solid distillate: Sp. gr. at 40°, 0.891 to 0.892; acid val., 75 to 132; ester val., 66 to 113; solid pt., 38° to 39°; insoluble in 10 vol. of 90 per cent. alcohol.

Liquid oil: Sp. gr at 15°, 0.9088 to 0.9123; opt. rot., +0° 14' to +1° 19'; refr. index, 1.47421 to 1.47646; acid val., 0 to 2.4; ester val., 167.7 to 180.5; soluble in 3 to 6 vols. and more of 80 per cent. alcohol.—Schimmel's Rep., April, 1912, 25.

Andropogon oils—Yield and Constants.—The volatile oils of several species of *Andropogon* have been distilled and examined at Buitenzorg, with the following results:

Andropogon intermedino contains only 0.03 per cent. of oil, having the sp. gr. at 26°, 0.919 and the opt. rot., —15° 30'.

Andropogon odoratus yielded 0.35 per cent. of oil, sp. gr. at 26°, 0.914; opt. rot., —31° 10'.

Andropogon procerus (?) yielded only 0.08 per cent. of volatile oil.—Schimmel's Rep., April, 1912, 25; from Jaarb. dep. landb. in Ned.-Indië.

Anise Oil—Adulteration with Petroleum Oil.—Ernest J. Parry describes the characters of a grossly adulterated anise oil which has recently circulated on the market, and which proved on nearer examination to consist to the amount of 40 per cent. of petroleum oil. From definite evidence in the author's possession, the adulteration was performed in London. There are, however, other abnormal anise oils which have recently arrived in London, which apparently require investigation.—Chem. and Drugg., Aug. 31, 1912, 372.

Bay Oil and Bay Rum—Production in the West Indies.—W. C. Fishlock gives some interesting particulars respecting the production of Bay Oil and Bay Rum in the West Indian Islands. He says that although no bay-leaves are grown in St. Thomas, the cen-

tralization of the bay-rum industry is in that island, this being due to the low import duties on rum and alcohol. In St. Thomas the bay-rum is made chiefly by admixture of bay oil with Demerara rum or with strong spirits. In St. Jan, which supplies St. Thomas with bay leaves and oil, the rum is usually made by distillation. For making bay rum by distillation, the charge is 400 lbs. of green leaves, or 200 lbs. of dried leaves, 65 gals. of Demerara rum, and water to fill (capacity of still not stated ! Rep.), the whole of the distillate being collected. The selection of the leaves, both for the preparation of the bay rum and the oil is important. There are apparently several varieties of the bay-tree (*Pimenta acris*) some yielding a better oil than others. Leaves with the best aroma are usually lighter green and more pointed in shape than leaves from inferior varieties. The false bay, or "lemoncilla," is similar to the true bay in general appearance, the most reliable distinction being the odor of the leaves when crushed, that of "lemoncilla" leaves being unmistakably rank. A small admixture of false leaves will spoil the bay oil. The stills used for producing the oil (and the bay rum ? Rep.) usually hold about 200 gals., the charge being 400 lbs. of green leaves, 35 lbs. of salt and water to fill. The average yield of oil is one bottle (1/6 gal.) from 130 or 140 lbs. of green leaves. The first oil coming over is light oil, of a greenish brown color, the darker, heavier oil that follows sinks to the bottom on account of its density ; but both seem to be used indiscriminately by bay rum makers. The chief source of bay oil at present seems to be Porto Rico, St. Thomas bay rum manufacturers viewing the oil produced on the English islands with suspicion.—Chem. and Drugg., Nov. 9, 1912, 714; from "West Indian Bulletin," xii, 513.

Benzaldehyde—Detection of Chlorine.—Dr. G. Heyle points out some of the defects of the G. P. V. process for the detection of chlorine in benzaldehyde, which are not removed completely even by the various modifications that have been suggested by Herzog and others. He therefore suggests the so-called "lime method" for the detection of the halogen which has proven reliable when carried out as follows: About 1 or 2 Gm. of calcium hydroxide (which, of course, must be free from Cl, and is so obtainable) is placed into a porcelain crucible, 10 to 15 drops of the benzaldehyde are added, and thoroughly incorporated with the hydroxide by means of a glass rod. The mixture is covered with a thin layer of calcium hydroxide, and is then carefully heated in the open flame, finally to redness. After cooling, the contents of the crucible are transferred to a beaker, 5-6 Cc. of water carefully added, followed by nitric acid

in faint excess, and the solution is filtered through chlorine-free filter paper (or glass wool). In the presence of chlorine, turbidity, greater or less according to the quantity, is produced on the addition of silver nitrate solution. By this method the presence of chlorine is sharply determined in a mixture of 1 drop benzol monochloride with 50 Gm. of pure benzaldehyde.—Apoth. Ztg., xxvii (1912), No. 6, 49-50.

Benzaldehyde.—*A Convenient Method of Detecting Chlorine*.—Referring to the above method proposed by Dr. Heyl, which doubtless yields reliable results, Prof. E. Rupp recommends the following simple method, which depends upon the fact that substances containing chlorine, when burned upon a surface of cupric oxide, produces cupric chloride, the smallest traces of which impart a green color to a non-luminous flame. To carry out the reaction a section of copper wire or, better, a strip of copper netting about 0.5 Cm. wide (with 1 Mm. meshes), is rolled closely—spirally at one end so as to form a roll about the thickness of a pea. This is drawn several times through a non-luminous gas—benzin, or alcohol flame, so as to form a surface of cupric oxide, and until all yellow or green color (due to NaCl) disappears. The reagent thus produced, after cooling somewhat, is simply dipped into the benzaldehyde under examination, held for a moment in the flame, and, after allowing the benzaldehyde to burn up completely out of the flame, it is again introduced into the non-luminous part of the same. If this now shows green luminosity chlorine is present in the sample, the duration and intensity depending proportionally to the amount of chlorine present and the quantity of benzaldehyde adhering to the spiral, which was experimentally found to be about 0.3 Gm. in a wire-net spiral or 0.1 Gm. in a wire spiral of the dimensions indicated.—Apoth. Ztg., xxvii (1912), No. 10, 92.

Bergamot Oils.—*Adulterations*.—Schimmel & Co. give the results of examination of fourteen samples of suspected bergamot oils which had been submitted to them for their opinion. All of them proved to be adulterated. Some of them having constants which in the main agreed with normal oils, were deficient in other respects, and contained added terpinyl acetate or other added esters in varying proportions. One sample, indeed, proved to be an altogether worthless artificial product. Six of the samples, in which no foreign esters were detected, proved to be of very low grade. The results are exhibited in form of tables giving the constants found in each oil.—Schimmel's Rep., April, 1912, 73-75.

Camphor—Cultivation and Preparation.—In view of numerous enquiries of planters regarding the cultivation of camphor trees and the preparation of camphor, the Government of the Federated Malay States have published a treatise by B. J. Eaton, in which the author preliminarily describes the different varieties of camphor, including ordinary camphor from *Cinnamomum Camphora* (the Japanese camphor tree), Borneo camphor from *Dryobalanops aromatica*, and N'gai camphor, from *Blumea balsamifera*; then describes the geographical distribution of the camphor tree and its cultivation in foreign countries, and follows this with an account of the experiments and results obtained in the Malay States. These were first made in 1904 at Batu-Tiga, Selanor, with seed obtained from Yokohama for this purpose. The plants flourished excellently and in 1909 the first camphor was distilled from the shoots of the five year old trees, yielding 1.17 to 1.22 per cent. from cut leaves, 1.25 to 1.47 per cent. from mouldy leaves, and 0.06 to 0.45 per cent. from small stems—the distillate consisting in each case of camphor with very little oil. Repeating the experiment upon a larger scale with parts of an entire tree, the yields were: from leaves, 1.0 per cent.; from stems under $\frac{1}{2}$ inch diameter, 0.22 per cent.; from stems over $\frac{1}{2}$ inch diameter, 0.61 per cent.; and from roots, 1.10 per cent.—the latter alone yielding an oil which possessed an odor reminding at the same time of camphor and of lemons. Finally, the author gives a review of similar experiments in other countries (Ceylon, India, Germ. E. Africa, Jamaica, West Indies, Italy, and Amercia), the results, with the authority, being shown in a table accompanying his treatise.—Schimmel's Rep., October, 1912, 28-29; from Bull., No. 15, Dep. of Agricult., Feb., 1912.

Camphor—Distillation from Leaves in Java.—A. W. K. de Jong reports the result of distillation of camphor leaves in Java. From 3560 kilos of green (?) leaves, he obtained 31.15 kilos of camphor and 14.1 liters of oil, while 376 kilos of branches (probably without leaves) only yielded a trace of oil. The distillation was conducted with steam of 3 to 5 atmospheres. This was passed through a galvanized iron case, enclosing three cylindrical cooling vessels filled with water, the floor and walls of the case being also washed by cooling water. In the floor of the case was a cock for drawing off the water of condensation. When the distillation was concluded the cooling vessels were removed from the case and the camphor which had distilled out was collected.—Schimmel's Rep., Oct., 1912, 29; from Teysmannia, 1912, No. 2, 125.

Cedarwood Oil—Chemistry.—In continuation of his researches on cedarwood oil, F. W. Semmler, in conjunction with E. W. Mayer, has discovered a new primary sesquiterpene alcohol ($C_{15}H_{24}O$), which he has named *cedrenol*. This alcohol stands in the same relation towards cedrene ($C_{15}H_{24}$) as do the two primary alcohols of the santalol series towards the santalenes ($C_{15}H_{24}$), and as myrtenol and the ginger grass alcohol stand towards pinene and limonene. When purified from primarily produced acetate, cedrenol has the following properties: Boiling point (9.5 Mm.), 166° to 169° ; sp. gr. 20° , 1.0083; opt. rot., 20° , $+0^{\circ}$; refr. index 20° , 1.5212. The primary CH_2OH -group in the cedrenol molecule occupies the same position which is occupied by the CH_3 -group in cedrene and in solid *cedrol* ($C_{15}H_{26}O$). In addition to cedrenol, the authors have observed in cedar oil a saturated alcohol, *pseudo-cedrol* ($C_{15}H_{26}O$), which, while chemically identical with cedrol, differs from it physically. *Pseudo-cedrol* boils between 147° to 152° and constitutes a viscous oil with the following constants: Sp. gr., 20° , 0.9964; opt. rot., 20° , $+21^{\circ} 5'$; refr. index, 20° , 1.5131.—Schimmel's Rep., October, 1912, 34-36; from Berl. Berichte 45 (1912), 786 and 1384.

The Oil of Cheiranthus Cheiri.—Matthes and Boltze report a study of this oil which was brought to their attention by W. Schneider, whose study of the alkaloid found in the seed (Annalen der Chemie, Vol. 357) furnished him a quantity of the oil, which he turned over to the present investigators. After giving physical constants of the oil furnished by Schneider and that prepared for them by Merck (both crude and purified) the writers give results of their chemical investigations of which the following is a summary.

The oil on steam distillation gives 0.027 per cent. of volatile oil, smelling like water fennel, sp. gr. 0.9035 at 15° ; b. p. 120° - 125° at 15 Mm. pressure; refractive index 1.692 at 20° ; angle of polarization, -12.37 ; iodine number 179.4. The oil remaining consists of (1) about 65 per cent. of cheiranthic acid, which is a solid optically inactive isomeric form of oleic acid with m. p. 30° , refractory index 1.4536 and an iodine number 71.16. Its composition was proven by combustions and by the di-oxystearic acid formed when it was oxidized with alkaline permanganate; (2) linoleic acid (about 30%); (3) linolenic acid (about 5%). The separation of the three acids was accomplished by brominating the acid mixture and then using appropriate solvents.

Lastly the oil contained a physosterin m. p. 136° - 137° , angle of polarization, -31.78° , iodine number, 77.14, having a composition

$C_{27}H_{44}O + H_{20}$ and forming an acetate (m. p. 128-129°), a benzoate (m. p. 142°) and a propionate (m. p. 108°).—Arch. d. Pharm., 250 (1912), No. 3, 211. (H. V. A.)

Oil of Chenopodium—Characters and Constituents.—It is stated in "Perf. and Ess. Oil Record" (Jan., 1912, 16) that oil of chenopodium is distilled from *Chenopodium ambrosioides* var. *anthelmintica*, and that most of it is distilled from herb grown in a section of Carroll County, Md., and is known as "Baltimore wormseed oil." Samples of steam-still oils examined have shown the following characters: Specific gravity, 25°/25°, 0.955 to 0.970; refractive index (25°), 1.4723 to 1.4726; optical rotation (25°), —5.4° to —8.8°; solubility in 7 per cent. alcohol (? 70%), 1 in 3 to 1 in 7. The figures from pot still oil were, respectively, 0.9584; 1.4725; —6.3°; and 1 in 6. Ascaridol is the active constituent of the oil, and about 7 per cent. was separated by fractionation under reduced pressure. It is described as a yellow oil with a peculiar, repulsive odor suggesting camphor and carvone. It had the following characters: Boiling point (8 Mm.), 96°-97°; specific gravity, 20°/20°, 0.9985; refractive index (29°), 1.4769; optical rotation (20°), +0.7°. The slight optical rotation may be due to traces of camphor.—Pharm. Journ. and Pharmacist, March 9, 1912, 319.

Ceylon Cinnamon Oil—Sophistication with Cassia Oil.—A sample of an oil sold in London as Ceylon cinnamon oil was submitted to Schimmel & Co. for an opinion on account of the low price at which it was offered. Analysis confirmed the suspicion that the oil was sophisticated; for, whereas pure Ceylon cinnamon oil has a sp. gr. from 1.023 to 1.040 and is slightly levorotatory, the sample in question was too heavy (sp. gr. 15°, 1.0423) and exhibited dextro-rotation (+0° 11'), these abnormalities being obviously caused by an addition of the much cheaper cassia oil. Moreover, the exceptionally high aldehyde content (77%, against a normal content of 65 to 76%) was in harmony with this adulteration.—Schimmel's Rep., Oct., 1912, 38.

Citronella Oil—Method of Direct Estimation of Geraniol.—J. Dupont and L. Labaune recommend a method for the direct estimation of geraniol in citronella oil, the basis of which is that the citronellal is first converted into its oxime; the oil is then acetylated, and after this the ester-value of the acetylated oil is determined. When the oximated oil is heated with acetic anhydride the citronellal oxime is converted into the nitrile of citronellic acid which, under saponification, is stable towards the alkali. Hence

only the alcoholic constituents react, but these of course do not represent only the geraniol which is present, but the total alcohols of the oil. The process is carried out as follows: 10 Gm. of citronella oil are first shaken up at ordinary temperature (15° to 18°) for two hours with a hydroxylamine solution (10 Gm. hydroxylamine hydrochloride and 12 Gm. potassium carbonate, each in 25 Gm. of water, and mixed). The oximated oil is then again dried and subsequently acetylated. The geraniol-content is next estimated from the ester value of the acetylated oil and the citronellal-content by subtraction from the so-called total geraniol. As the molecular weights of citronellal (154) and of the nitrile of citronellic acid (151) correspond very nearly, the conversion of citronellal may be disregarded in the calculation. The citronellal regenerated from the bisulphite compound which the authors employed in their experiments was first tested for purity by the method described, this manipulation showing that 2.5 per cent. of an alcohol $C_{10}H_{18}O$, doubtless isopulegol, was present, and taking this source of error into account, correct values were obtained for artificial mixtures of geraniol and citronellal. Applying this method in actual determinations, the authors obtained the following results:

Ceylon citronella oil contained 60.2 per cent. of so-called total geraniol, and 43 per cent. of actual geraniol, which, deducted from the total, gave 17.2 per cent. of citronellal.

Java citronella oil gave 83 per cent. of so-called total geraniol, and 43 per cent. of true geraniol, which, deducted from the total, gave 40 per cent. of citronellal.—Schimmel's Rep., Oct., 1912, 40; from Rep. Roure-Bertrand Fils, April, 1912, 3.

The above method for the direct estimation of geraniol in citronella oil gave the incentive to investigation by Schimmel & Co., not only of the proposed method, but also of comparative experimentation of the methods hitherto employed by them and of other methods that have been recommended. From this investigation they draw the conclusion that the separate determination of both geraniol oil and citronellal in citronella oil is possible. For the former the phthalic anhydride method recommended by them in 1899-1900 is the only one which is of any value, as in all the other methods, in addition to geraniol, the other alcohols which are present in the oil are also estimated at the same time. For determining the citronellal-content the oximation method is suitable, and it is probable that the phenylhydrazine method recommended by Kleber may be applicable for this purpose, but with regard to the latter further

experiments are necessary. In the case of Ceylon citronella oils the citronellal content may be ascertained by a bisulphite method recently worked out by M. V. Boulez.—Schimmel's Rep., Oct., 1912, 4047.

Ceylon Citronella Oil—Examination of an Authentic Product.—Schimmel & Co. give the results of an examination of an authentic original oil of citronella, which has yielded many interesting data on the constitution of this oil. The material worked up consisted of portions of numerous fractions which had been obtained by fractional distillation from a large parcel of oil. The results of this elaborate examination, which is described in detail, have shown that Ceylon citronella oil contains the following bodies in addition to those previously known: a hydrocarbon of low specific gravity (terpene?); a body related to linalool; an alcohol which may be found to be identical with thujyl alcohol; nerol; *d*-citronellol (but only in the form of acetic and of *n*-butyric ester); geranyl acetate; and a high-boiling hydrocarbon $C_{15}H_{24}$. It is certain that neither linalool nor valeric acid can be counted among the constituents of the oil.—Schimmel's Rep., April, 1912, 44-50.

Citronella Oil from the Gold Coast—Characters and Constants.—According to a communication by the Imperial Institute, London, a sample of citronella oil received from the Gold Coast possessed the following characters: Sp. gr. at 15° , 0.903; opt. rot., $+2^{\circ} 56'$; geraniol, 33.9%, citronellal, 42.1% (total as geraniol=76%); soluble in 2.8 vols. 70% alcohol and in 1.4 vols. 80% alcohol. The oil, which was of a pale yellow color, is thought to be derived from *Cymbopogon Winterianus*.—Schimmel's Rep., April, 1912, 54.

Oil of Cloves—Adulteration with Castor Oil.—Schimmel & Co. call attention to a sample of clove oil submitted for their opinion from England, which on examination proved to be imperfectly soluble in 70% alcohol and showed a dextro rotation of $+0.30'$, whereas pure oil of cloves is laevorotatory. It was found to be adulterated with 10% of castor oil, which accounts for its dextro-rotatory properties.—Schimmel's Rep., Oct., 1912, 48.

Oil of Clove Stems—Isolation of a New Sesquiterpene Alcohol.—F. W. Semmler and E. W. Meyer have isolated from the higher boiling fractions (b. p. 143° to 155° at 9 Mm.) of oil of clove stems a sesquiterpene alcohol, $C_{15}H_{26}O$, which they found to possess the following constants: b. p., 138° to 148° ; sp. gr., 20° , 0.9681; opt. rot., -17° ; refr. index, 1.5010; mol. refr. found, 68.18 (calculated for $C_{15}H_{26}O$, 68.07). Judging from these values

the body is a bicyclic sesquiterpene alcohol with one double bond. The chloride of this alcohol, when treated with alcoholic potash, yields a hydrocarbon having the following constants: b. p., 123° to 126° (10 Mm.); sp. gr. 20° , 0.9273; opt. rot., 20° , -23° ; ref. index, 20° , 1.5024.—Schimmel's Rep., October, 1912, 49; from Berl. Berichte, 45 (1912), 392.

Oil of Copaiba—Estimation of Quality.—The discovery of caryophyllene as a constituent of genuine copaibas affords according to E. Deussen and B. Egers an important test for estimating the quality and source of copaiba oils—the test consisting in the preparation of the nitro-compound (β -nitro-caryophyllene) and estimating its quantity. So far as has been determined from available material, the limit of value for the yield of nitro-products are from 14 to 16 per cent. in Pará—and from 5 to 8 per cent. in Maracaibo copaiba oil. The exact proof of the presence of gurjun balsam oil in copaiba oil is only afforded by the preparation of gurjunene ketone semicarbazone, which, apart from its melting point (234°), is characterized by the high specific rotation ($+317^{\circ}$ in concentrated aqueous chloral hydrate solution).—Schimmel's Rep., October, 1912, 49; from Chem. Ztg., 36 (1912), 561.

Elecampane Oil—Characters and Constants.—Schimmel & Co. have recently distilled the volatile oil from elecampane roots, about which hitherto little has been known. The product appeared in the form of a mass of colorless needles, saturated with a small proportion of a brown oil, and deliquescent at 40° to 45° into a brown liquid. It has a peculiar odor, somewhat like that of laudanum, the high sp. gr., 1.074 at 30° , and the pronounced optical rotation of $+123^{\circ} 45'$; acid val., 6.4; ester val., 180.0; ester val. after acetylation, 199.0.—Schimmel's Rep., April, 1912, 60.

Garlic Oil—Estimation of Sulphur Content.—According to Manindranath Banerjee, a ready method for estimating the sulphur content in garlic oil is to triturate it in a mortar with mercury containing lead as impurity, whereby lead sulphide, together with a minute proportion of mercuric sulphide, is formed. It is, in fact, possible by this means to free the mercury entirely from lead.—Schimmel's Rep., April, 1912, 81; from Proc. Chem. Soc., 27, 234.

Geraniol—Direct Estimation in Citronella Oil.—In the "Perfumery and Essential Oil Record," May, 1912, a method for the direct estimation of geraniol in citronella oil is suggested as follows: Ten gm. of hydroxylamine hydrochloride is dissolved in 25 Cc. of water; 10 Gm. of potassium carbonate separately dissolved in 25

Cc. of water is added, and the mixture filtered. With this solution 10 Gm. of the oil is thoroughly shaken for two hours at 15°-18° C. The oil is then separated, dried by means of anhydrous sodium sulphate, and acetylated with twice its volume of acetic anhydride in the usual way for one and a-half hours on a sand-bath under a reflux condenser. The oil is washed, dried, and neutralized, and a weighed quantity (about 2 Gm.) is saponified with alcoholic potash. The calculation is made by the usual formula.—Pharm. Jour. and Pharmacist, June 1, 1912, 732.

Gingergrass Oil—Abnormal Sample.—The "Perfumery and Essential Oil Record," May, 1912, mentions that a sample of gingergrass oil, giving analytical figures similar to those of genuine specimens, differed in having a high lævorotation, namely, -21° . The result of fractional distillation failed to indicate any foreign admixture separable by that method. This abnormal oil was considered equal to that of previous samples.—Pharm. Journ. and Pharmacist, June, 1912, 732.

Iva Oil—Chemical Investigation.—With the object of filling-in the somewhat incomplete data available on the subject of iva oil, Schimmel & Co. have examined in some detail one of their most recent distillates. It had been prepared from the dry flowering herb (*Achillea moschata*, Jacq. ?), the yield being about 0.37 per cent. of oil of a bluish-green color and an intense, narcotic odor, which also reminded of valeric aldehyde, cineole and thujone. The constants were as follows: Sp. gr., 15°, 0.933; refract. index, 20°, 1.47607; acid val., 7.5; ester val., 18.7; ester val. after acetyl., 91.5; soluble in 0.7 vols. and more of 70 per cent. alcohol, with elimination of paraffin. In addition to an aldehyde (valeraldehyde ?), the investigation revealed the presence of lævo-camphor as a hitherto unknown constituent of the oil, which appears to possess also alcoholic constituents, partly esterified, partly in the free state, as is indicated by the saponification values of the original and the acetylated oil.—Schimmel's Rep., April, 1912, 83.

Cyprus Juniper Berry Oil—Properties.—Schimmel & Co. describe a sample of juniper berry oil distilled in cyprus, which they received from the Imperial Institute in London, and is interesting both as a novelty in respect of its origin as also on account of its properties. The oil was extremely faint pale-yellow and had an odor reminding not so much of juniper berry oil as of pumilio oil. It had the sp. gr., 15°, 0.8688; optical rot., $+3^{\circ}$, 41'; refr. index, 20°, 1.47210; acid val., 0.6; ester val., 10.2; soluble in 8 vols. and more of 90

per cent. alcohol, with slight cloudiness. From the dextrorotation of this oil, coupled with its peculiar odor, it may be inferred that juniper needles have also been worked up with the berries in the distillation. Samples of Russian juniper berry oils received several years ago, which were made from similar material, were also found dextrorotatory.—Schimmel's Rep., Oct., 1912, 68.

Oil of Lavender—Phthalic Acid Ester an Adulterant.—In 1908 T. Delphin called attention to cocos-ester as an adulterant of oil of lavender. He has now determined a new adulterant in lavender oil derived from southern France, which proved to be an ester of phthalic acid. This acid is now prepared and used industrially in the manufacture of colors and on account of its cheapness and the general character of its esters lends itself economically as an adulterant of volatile oils. Although the acid was positively identified as phthalic acid among the products of saponification of the lavender oil, by its molecular weight, chemical reactions and constants, the small quantity of material prevented the identification of its ester-component. The author, however, conjectures that the adulterant is probably the ethyl-ester of phthalic acid, the characters and constants of which, and particularly its faintly odorous properties appear to adapt it to its fraudulent use.—Pharm. Ztg., lvii (1912), No. 27, 272; from Svensk. Farm. Tidskrift, 1912, No. 5.

English Lavender Oil—Changes in Storing.—E. T. Brewis and J. C. Umney have observed some very abnormal characters (e. g. a very high percentage of ester) in English oil of lavender, known to be pure, which had been stored for some time. Two samples stored in wide-mouthed corked bottles, and having an ester percentage of over 20, were at once distinguishable by smell, which was of a most unpleasant resinous and acetic character; they were practically valueless. One sample, preserved by the addition of an equal volume of rectified spirit, had kept most imperfectly, developing a very distinct and unpleasant odor of paraldehyde. Samples of genuine oil stored in partially filled bottles, but securely corked, showed, after eight to eleven years, much increase in acidity and ester contents, at the same time deteriorating in fragrance. The conclusions the authors come to are that the actual age of the lavender oil has no direct bearing upon its composition; that the changes that do occur are not even dependent upon season; that the changes that occur are not by any means uniform. The only possible explanation of the changes occurring in certain samples without any distinct relation either to season or other points is according to the percentage of water remaining

in the oil, and this percentage is a matter of some importance. A reasonable supposition is that the oxidation of terpenes proceeds more rapidly in presence of moisture, although the oxidation does not appear to affect materially the esters and alcoholic constituent since they can be recovered almost unchanged by steam distillation. Many oils have the property of taking up considerable quantities of water, *e. g.*, half-ton drums of citronella oil, which were brilliantly clear on shipment from Ceylon, have been found to contain from 6 to 7 lbs. of separated water on arrival in London. A suggestion in the meantime is that all essential oils should be most carefully dried by means of exsiccated sodium sulphate or other similar drying material.—Pharm. Journ. and Pharmacist, March 2. 1912, 289; from Perf. and Ess. Oil Rec., Jan., 1912, 5.

Spike Lavender Oils—Solubility in 60 per cent Alcohol.—According to private information to Schimmel & Co. it has been observed that the degree of solubility of spike oil varies with the origin of the material. Oils from the Alps and from Provence are said to be soluble in 60 per cent. alcohol, while the distillates from the Departments of the Bouches-du-Rhone, Vaucluse, Gard, Hérault, and Aude, are said to be only rarely soluble in 60 per cent. alcohol. The differences are said to be due to variations in the conditions of the soil and the climate, and also to the method of distilling, distillation being often carried out without water and cooling. The matter is further complicated by the circumstances that, in order to increase the weight, the herb-cutters often mix other plants with the spike, such as *Saturja montana*, L., *Calamintha officinalis*, Moench, *Sideritis romana*, L., *Teucrium Polium*, L., etc., which, when the admixture is moderate, it is very difficult to pick out. With the object of checking the accuracy of these statements, Schimmel & Co. therefore secured through a business friend a collection of spike oils from various Departments for examination, the results of which are shown in a table, including five distillates from different localities in the Basses-Alpes, and one each from Vaucluse, Bouches-du-Rhone, and Drôme. The results do not confirm the assertion that the degree of solubility depends upon the origin of the oil; on the contrary, generally speaking all the oils are soluble in the same degree, and deviations occur independently of the locality of production. Three of the oils from the Alps dissolved in 6 vols. and more of 60 per cent. alcohol, one in 7 vols., and the fifth in 20 vols. The other oils in the order mentioned, dissolved in 7, 7.5, and 14 vols. of and more of 60 per cent. alcohol. The inference is plain

that any solubility difference in spike oil must be attributed to methods of distillation and greater or less care in collection of material.—Schimmel's Rep., April, 1912, 118.

Lemon Oil—New Method for Estimating Citral-Content.—Dr. Kleber describes a new method for the estimation of the citral-content in lemon oil, which is based on the observation that phenylhydrazine (when di-ethyl orange is used as an indicator) gives a sensitive titration with mineral acids, and that with aldehydes and ketones it forms hydrazones which give a neutral reaction with di-ethyl orange. About 10 Gm. lemon oil are exactly weighed into a flask, 20 Cc. of freshly prepared 5 per cent. alcoholic phenylhydrazine solution are added, the stoppered flask is allowed to stand about half an hour at about 35°, after which as much seminormal hydrochloric acid is added as is required to neutralize the phenylhydrazine solution, the quantity having been previously estimated by a separate test. The mixture is poured into a separator, the flask itself is rinsed out with 20 Cc. of water and the whole vigorously shaken. As soon as the two layers have separated, the lower of the two is drawn off into an titration flask, the residue washed out with 5 Cc. of water, the washings added to the solution previously run off, and the total contents of the flask are titrated with seminormal soda solution. Di-ethyl orange is used as an indicator and in all cases the titration is made for the brownish tint which precedes the pink coloration. As each Cc. of seminormal soda solution corresponds to 0.076 Gm. of citral, the citral content of the oil may be calculated from the amount of soda solution consumed. Concordant results are obtained in the case of mixtures of known composition, the difference rarely exceeding 0.1 per cent.—Schimmel's Rep., April, 1912, 75-76.

Reviewing the method of Kleber above described, Schimmel & Co. endorse it as being satisfactory and reliable. Having privately known it for some time, they have modified the method somewhat, and give a description of the modification.—Ibid., pp. 76-77.

Oil of Lemon—Novel Method of Valuation.—Lemon oil consists principally of terpenes and sesquiterpenes, which are of slight importance so far as the odor of the oil is concerned, and are practically insoluble in 80 per cent. alcohol, whereas the valuable odoriferous constituents are readily soluble in the same alcohol. This forms an excellent criterion for the valuation of the lemon oil, which G. Patané applies in two different manipulations. The first consists in shaking up at exactly 20° in a test tube of 10 Cc. capacity, gradu-

ated to 0.1 Cc., equal quantities (volumes ?) of oil and of alcohol of a given strength. When the mixture has completely separated, the degree of increase of the alcohol layer is read off. The second method consists in mixing equal quantities of oil and of the alcohol in the test tube and warming them until complete solution is effected. The mixture is then allowed to cool, constantly stirring with a thermometer, graduated to 1/10th degrees, until clouding ensues, and noting the point. Differences of 1/10th degree are sufficient to cause clouding. All oils which have the same clouding-temperature show the same conditions of solubility in the first test, so that it becomes possible to draw up a comparative scale of clouding-temperature and solubility. The addition of 10 per cent. of terpenes increases the clouding temperature one degree, 20 per cent. two degrees, and so on. Great care must be taken with the alcohol used for the test, because so slight a difference as 1/10th of a degree suffices to alter the clouding temperature of the alcohol.—Schimmel's Rep., October, 1912, 61; from Reprint of the author's paper, Acireale, 1912.

Oil of Lemon—Adulteration with Oil of Turpentine.—Parry reports on several shipments of oil of lemon which were distinguished by their abnormally low optical rotation ($+50^{\circ}$ to $+54^{\circ}$) and their very low citral content (3.3 to 4.1%). Closer examination revealed the presence of copious quantities of pinene, pointing to sophistication with oil of turpentine. Moreover, considering the amount of adulterant present and the comparatively small drop in optical rotation, the author was led to suspect that the adulterant in every case was Greek turpentine oil, a view which was subsequently confirmed by the information from Sicily that Greek turpentine oil is used there as an adulterant of lemon oil.—Schimmel's Rep., April, 1912, 78; from Perf. and Essent. Oil Rec., 2, 209.

Burmese Lemongrass Oil—Soluble and Insoluble Variety.—It has been reported that a sample of lemongrass oil distilled from cultivated grass at Moulmein, in British Burmah, although containing a very high percentage of citral (over 82%), was of the insoluble variety. Further experiments have been made in connection with the cultivation of the red-stem and the white-stem grass, *Cymbopogon flexuosus* and *C. citrus* respectively, the latter yielding the oil referred to. A sample of oil distilled from this variety occurred in lower percentage, but was readily soluble in three volumes of 70 per cent. alcohol. The difference is not easily accounted for, but it seems that it is not possible to differentiate between the two varieties

of *Cymbopogon*, and to lay down on hard-and-fast lines that the one yields a soluble and the other an insoluble oil.—Pharm. Journ. and Pharmacist, June 1, 1912, 732; from Perf. and Essent. Oil Record, May, 1912.

Linaloe Oil—Linalool Monoxide a Constituent from Mexican and Cayenne Linaloe Distillates.—In the course of the examination of the oils distilled from Mexican and also from Cayenne linaloe wood, in 1908, Schimmel & Co. isolated a body having the formula $C_{10}H_{18}O_2$, which they set down as an oxide of linalool. In 1810, N. Prileschaeff engaged in the investigation of the oxidation products of unsaturated compounds, mentioned among others a linalool monoxide, which Schimmel & Co. were able to show was identical with the oxide $C_{10}H_{18}O_2$ previously isolated by them. To confirm their previously expressed opinion, they have now prepared the monoxide by Prileschaeff's method, and find the two bodies to be identical. The body is somewhat viscous and is clearly differentiated from linalool by its mouldy odor, which they account for as the result of a gentle oxidation possibly favored by the moist climate of the tropics in its effect upon the wood.—Schimmel's Rep., October, 1912, 78-80.

Mexican Linaloe Oil—High Ester-Value in Isolated Cases.—In connection with their observation regarding the isolation and identification of linalool monoxide in the oils distilled from Mexican and Cayenne linaloe wood (which see), Schimmel & Co. mention in an experience covering many years, the distillates were characterized by low ester-values—that of the cayenne oil being at most 6.5, while that of the Mexican oil lies between 1 and 30. Higher values indicated either an adulteration or at least a low linalool content, geraniol and terpineol having accumulated in the oils. Lately, however, they have repeatedly received Mexican oils of which the ester value reached 40, and in isolated cases up to 75. Nevertheless, their suspicion that these oils were adulterated or inferior was not confirmed, for as a matter of fact the oils, so far as the other constants were concerned, were quite normal, and they were only distinguished by their high linalyl acetate content. At present they are still unable to give an explanation of this peculiarity, but in any case the fact will have to be taken into account that it is possible for linaloe oils of good quality to have a somewhat higher linalyl acetate content.—Schimmel's Rep., October, 1912, 80.

Cayenne Linaloe Oil—Investigation of the Distillation-Waters and First Runnings of the Oil.—The distillation of a large quantity of Cayenne linaloe wood afforded Schimmel & Co., an opportunity

for investigating the distillation-waters as well as the first runnings of the oil more closely. The cohobation-waters still contains considerable proportions of oil, and especially of linalool, and in addition to these two aldehydes. The first and larger portion of these was identified to be furfural; the second, which was not obtainable in a pure condition, being present only in comparatively small quantity, is apparently isovaleraldehyde. The cohobation oil, when freed from its aldehyde, contained, in addition to methylheptenol, cineol, which was present in amounts of from 30 to 40 per cent. The first runnings appear to contain, in addition to cineol and diterpene, an aliphatic terpene. It was impossible to isolate this body by fractionation; but by acting upon it with glacial acetic acid and sulphuric acid, about 10 per cent. of an ester was obtained of which the alcohol, after saponification, melted between 210° and 215° , and had the sp. gr. at 15° , 0.915. As the fraction which had been used for hydration, contained neither sabinene, camphene, fenchene, or pinene, the surmise that the alcohol has been generated from an aliphatic terpene is probably well founded. It is highly probable that this body is identical with myrcene.—Schimmel's Rep., April, 1912, 91-92.

Australian Melaleuca Oils—Cajuput Oil not a Typical Representative.—In continuation of their investigation of the Australian Melaleuca-species, R. T. Baker and H. G. Smith have discovered that cajuput oil (from *Melaleuca Leucadendron*, L.) is not a typical representative of the melaleuca oils, as is shown in the following oils which deviate considerably from cajuput oil in their constitution:

Oil of Melaleuca genistifolia, Sm., obtained from leaves and terminal branchlets in a yield of 0.526 per cent., was pale yellow and had a well-defined odor of turpentine; sp. gr., 15° , 0.8807; opt. rot., $+32^{\circ} 7'$; refr. index, 22° , 1.4702; sap. val., 6.8; insoluble in 10 vols. 80 per cent. alcohol. Contains from 80 to 90 per cent. of pinene, and only 2 per cent. of cineol.

Oil of Melaleuca gibbosa, Labill, obtained from leaves and terminal branchlets in a yield of 0.158 per cent., was deep yellow and had an odor of cineol and pinene; sp. gr., 15° , 0.9138; opt. rot., $+4^{\circ} 5'$; refr. index, 20° , 1.4703; sap. val., 9.9; insol. in 10 vols. of 70 per cent. alcohol, but soluble in its own vol. of 80 per cent. alcohol. Contains 61.5 per cent. cineol, some α -pinene, a sesquiterpene and perhaps also terpinyl acetate.

Oil of Melaleuca pauciflora, Turcz., obtained from leaves and terminal branchlets in a yield of 0.3 per cent., was of a dark amber color and had a somewhat viscous consistence; sp. gr., 15° , 0.9302; opt. rot., $+3^{\circ}$, $3'$; refr. index, 24° , 1.4921; sap. val., 8.25; barely soluble in 10 vols. of 80 per cent. alcohol. Contains only 8.7 per cent. of cineol, the principal constituent being a sesquiterpene, which appears to occur in the high boiling fractions of many melaleuca oils. The oil may contain limonene or dipentene, possibly also terpinyl acetate as well as about 5 per cent. of free terpineol.—Schimmel's Rep., October, 1912, 81; from Jour. and Proc. Royal Soc. of N. S. W., 45 (1911), 365.

Oil of Mosla—Hydrocarbon Constituent.—Y. Murayama and Y. Nara several years ago determined the presence of carvacrol and p-cymol in the oil of *Mosla Japonica* Maxim and have now isolated α -pinene as another constituent.—J. Ph. Soc. Jap., 1912, No. 363, 457. (O. R.)

Algerian Myrtle Oil—Properties and Constants.—Schimmel & Co. have recently had opportunity to examine myrtle oil of Algerian origin with the following results: Sp. gr. at 15° , 0.8871; opt. rot., $+25^{\circ}$, $52'$; refr. index, 20° , 1.46466; acid val., 1.1; ester val., 20.5 (after acetylation, 39.2); soluble in 0.5 or more of 90 per cent. alcohol. These figures agree with those of a Corsican oil previously examined.—Schimmel's Rep., April, 1912, 94.

Dutch Myrtle Oil—Characters and Constants.—S. S. Pickles has made an investigation of the constituents of the volatile oil distilled from *Myrica Gale*, L., commercially known as "Dutch Myrtle Oil," about which practically nothing had hitherto been known. From the green leaves and branches he obtained 0.076 per cent. of a pale yellow oil, giving the following constants: Sp. gr. at 15° , 0.915; opt. rot., -5° , $17'$; acid val., 7.0; sap. val., 31.7; ester val., 24.7. From half-dried material, consisting almost entirely of leaves, he obtained 0.203 per cent. of oil, having the following constants: Sp. gr. at 15° , 0.912; opt. rot., -11° , $26'$; acid val., 4.0; sap. val., 23.2; ester val., 19.2; ester val. after acetylation, 56.4. This leaf oil contained about 0.75 per cent. of a paraffin $C_{29}H_{60}$ (m. p. 63° to 64°), which separated in the cold on addition of methyl alcohol. It contains about 50 per cent. of cineol and terpene, about 2.5 per cent. of fatty acid, principally palmitic acid in form of ester, and probably a mixture of high-boiling alcohol and sesquiterpenes, which have not been closely examined by the author owing to insufficiency of material.—Schimmel's Rep., April, 1912, 60; from Journ. Chem. Soc., 99 (1911), 1764.

Dutch Myrtle Oil—*A Distillate from the Catkins*.—C. J. Enklaar has distilled from the catkins of the "Dutch Myrtle," 0.4 to 0.6 per cent. of volatile oil, which on examination showed a different constitution from that of the leaves (see preceding abstract). The catkin oil had the sp. gr., 15° of 0.899 and the opt. rot. of $-5^{\circ}36'$. The lowest boiling fraction contained pinene, but whether α - or β -pinene, the author was unable to distinguish. The oil apparently also contains *d*- α -phellandrene, and the presence of cineol was proven. From the higher boiling fractions a sesquiterpene, perhaps caryophyllene, was separated, together with a sparingly soluble body which crystallized from alcohol in beautiful long needles and possessed the agreeable odor of Dutch myrtle.—Schimmel's Rep., October, 1912, 54; from Chem. Weekblad, 9 (1912), No. 11.

Nigella Oil—*Synthesis of its Alkaloidal Constituent—Damascenine*.—The beautiful blue fluorescence of the oil of *Nigella damascena*, L., is due to the presence of an alkaloid, damascenine, which A. J. Ewins has recently shown can be prepared synthetically (see damascenine under "Organic Bases"). Since then the author has described the results of his investigation in greater detail, the synthetic process consisting in the conversion of *m*-hydroxybenzoic acid into methoxybenzoic acid, this into a nitro-derivative, reducing this to aminomethoxybenzoic acid, and converting this into the hydriodide and finally into the hydrochloride of methyl-amino methoxybenzoic acid, which is identical with the hydrochloride of damascenine acid. From this the conversion into damascenine results by treatment in a well known manner. The further result of the investigation has shown that the formula $C_9H_{11}NO_3$, assigned to damascenine by Pommerehne (1900) is incorrect, while the formula $C_{10}H_{15}NO_3$, assumed by Schneider (1890), almost corresponds with the actuality. Furthermore, that the so-called "methyldamascenine" which has been isolated from the seed of *Nigella aristata* by Pommerehne and Keller (1908) is identical with damascenine.—Schimmel's Rep., October, 1912, 84-85; from Journ. Chem. Soc., 101 (1912), 544.

Philippine Orange Oil—*A Satisfactory Oil from Citrus reticulata*.—According to Brooks it appears possible to prepare an orange oil in the Philippine Islands from the peel of the fruit of *Citrus reticulata*, Blanco, known locally as *naranjita*, which is almost identical with Italian orange oil. An oil pressed from the green peel had the following constants: opt. rot., $(+ ?)$, 90.85° ; refr. index, 30° , 1.4700, ester val., 8.0; residue of evaporation, 2.25 to 2.40 per

cent. Contained about 92 per cent. limonene, about 0.3 per cent. of a wax-like stearoptene (m. p. 116° to 117°), 0.5 per cent. of an acid (possibly butyric or caprylic), and traces of a phenol. *Citrus reticulata* is generally regarded as being synonymous with *C. Aurantium*, L., but the author is of the opinion that this is not correct. Another *Citrus* species which is cultivated in the Philippines is *Citrus Aurantium*, Blanco, the fruit of which is locally known as *cajil*. This fruit is not suited for the preparation of oil, the yield being too small. The constants are: Sp. gr., $30^{\circ}/30^{\circ}$, 0.839; refract. index, 1.4675; sap. val., 8.5.—Schimmel's Rep., April, 1912, 78; from Philipp. Journ. of Sc. 6, a. 345.

Italian Parsnip Oil—Yield and Constants.—Roure-Bertrand Fils give the following constants of a sample of Italian parsnip oil, distilled from the entire plant in a yield of 0.1%: Sp. gr., 15° , 0.8970; opt. rot., $+0^{\circ} 6'$; acid val., 5.6; sap. val., 228.9; ester val. after acetylation, 251.1; soluble in two volumes and more of 80 per cent. alcohol, a considerable amount of paraffin separating when more alcohol was added.—Rep. Roure-Bertrand Fils, April, 1912, 28.

Oil of Peppermint—Influence by Cultivation.—This is article No. 7 by the Committee of the Austrian government for the increased cultivation of medicinal plants, which articles have since been published in book form: "Ueber Kulturversuche mit Arzneipflanzen in Korneuburg," by Prof. Dr. W. Mitlacher. The peppermint herb was cultivated under various conditions, the second highest yields being obtained with fertilizers of manure and saltpeter, and the highest with manure, saltpeter, superphosphate and potash salt, which herb also yielded the highest percentage (0.95) of volatile oil. Dr. Gustav Mossler, of the chemical-pharmaceutical laboratory of the University of Vienna, made a complete analysis of the different oils, which he tabulated and which should be consulted in the original article.—Ph. Post, 1912, No. 1, 2-5. (O. R.)

Pine Oil ("Kienöl")—Detection in Oil of Turpentine.—According to Dr. C. Piest, the presence of pine oil ("kienöl") in oil of turpentine may be detected by means of acetic acid anhydride and hydrochloric acid in the following manner: Shake 5 Cc. of the suspected oil with 5 Cc. of acetic acid anhydride in a test tube; then with shaking and cooling add 10 drops of concentrated HCl, whereby heat is developed. After cooling, 5 drops more of concentrated HCl are added and the mixture is shaken. The liquid is now hot, and becomes clear, and if pure oil of turpentine is colorless; but if it is pine oil it becomes black—the presence of 10 per cent. being dis-

tinctly recognizable, whilst even 5 per cent. produces faint darkening of the solution. Old samples of oil of turpentine must, however, be redistilled before applying this test, and then assumes at most a yellowish tint.—Pharm. Ztg., lvii (1912), No. 38, 382; from Chem. Ztg., 1912, No. 22.

Oil of Poplar Buds—Constants of Two Distillates from Different Localities.—Schimmel & Co. have distilled two oils from poplar buds, the one at the Bodenbach works, the other at Miltitz, which in the order named had the following properties, respectively: Color, pale yellow and light brown; sp. gr., 15° , 0.8906 and 0.9036; opt. rot., $+6^{\circ} 2'$ and $3^{\circ} 54'$; refr. index 20° , 1.49668 and 1.49623; acid val., 1.9 and 11.3; ester val., 7.5 and 13.4; ester val. after acetylation, 18.0 and 53.0; sol. in five vols. and in one vol., respectively, of 95 per cent. alcohol, with separation of paraffin in the first and more in the second distillate—the differences in the acid, ester and acetylation values of the Miltitz oil being obviously connected with the more thorough extraction of the material by the distillation.—Schimmel's Rep., Oct., 1912, 95.

Bulgarian Rose Oil—Present-day Primitive Method of Production.—Dr. P. Siedler, in an address delivered at the October session (1912) of the German Pharmaceutical Society, after giving an interesting account of his journey through the Bulgarian "rose-land" and description of the cultivation and gardening of the red and white roses used exclusively for the production of the Bulgarian oil of rose, describes the method of distillation which, with a few more modern exceptions, is mostly carried out in the old, somewhat primitive manner. According to this method, 60 Kgm. of hot water and 12 Kgm. of rose petals are introduced into the still, and 12 liters of distillate are collected, and from this 2 liters are then distilled and set aside, when upon standing the rose oil separates and is removed from the surface. The yield is very variable and depends on a variety of conditions; in general about 1 Kgm. of rose oil is obtained from 1000 Kgm. of rose petals—the best oil and most abundant yield being obtained from the red roses; but the white roses will flourish in localities that are unsuitable for red roses, and the rose oil produced in Bulgaria is therefore mostly a mixture of the two varieties of oil. As has been noted by others, the author mentions that the adulteration of the oil during its production is frequently practiced, the principal adulterants being palmarosa oil, geranium oil, spermaceti, paraffin, alcohol, etc.—Pharm. Ztg., lvii (1912), No. 81, 818.

Savin Oil—Forensic-Chemical Determination in Poisoning Cases.—Juho Hamalainen describes a method for the determination of savin oil in cases of poisoning, which is based upon the property of sabinol to unite with glucusonic acid in the organism, and of the resulting sabinol-glucusonic acid to form a characteristic salt with strychnine. Oil of savin contains about 50 per cent. of sabinol acetate, which by saponification in the organism is converted into sabinol and so partially, united with glucusonic acid, passes into the urine. The test is carried out as follows: The urine is precipitated in the usual manner with lead acetate, the precipitate removed by filtration, and washed; the filtrate and washings are made alkaline and basic lead acetate is added as long as a precipitate is produced. The basic lead salt is washed, decomposed with H_2SO_4 in the cold, the $PbSO_4$ is removed by filtration, and the filtrate, after neutralization with $BaCO_3$, is concentrated. The Ba is then quantitatively precipitated with hot strychnine sulphate solution, and the mixture filtered while hot. On cooling the filtrate, strychnine sabinolglucosonate crystallizes out in splendid, comparatively stout needles, which are recrystallized from a little boiling water. The salt so obtained melts without decomposition at 190° - 197° .—Pharm. Ztg., lvii (1912), No. 56, 563; from Biochem. Ztschr., 41 (1912), No. 3 and 4.

American Spearmint Oil—Properties of an Authentic Specimen.—E. K. Nelson reports the results of the chemical examination of an authentic sample of American spearmint oil, which had been distilled in Michigan from selected raw material. It possessed the following characters: Sp. gr., 30° , 30° , 0.9290; opt. rot., -52.16° ; refr. index 20° , 1.4866; ester val., 12.4 (after acetylation, 36.4); soluble in its own vol. of 80 per cent. alcohol. It contained 66 per cent. of carvone, together with phellandrene and l-limonene, and in addition to acetic acid (possibly also butyric, caproic or caprylic acids), 0.1 per cent. of a solid acid, m. p. 182° to 184° , which the author has also observed in several other samples of spearmint oil. No fraction of the oil had an odor of menthol.—Schimmel's Rep., April, 1912, 117; from Circ. No. 92, U. S. Dep. Agric., Bureau of Chem.

Hungarian Spearmint Oil—Characters and Constants.—According to K. Irk. Hungarian spearmint oil constitutes a straw-colored or faintly greenish-yellow liquid, which is obtained in a yield of 0.5278 per cent. from the green herb, and of 1.8530 to 2.4814 per cent. from the dry herb. Sp. gr., $15^\circ/40^\circ$, 0.9375 to 0.9513; opt.

rot., -44.38° to 49.85° ; refr. index 20° , 1.4899 to 1.4931; soluble in its own vol. of 80 per cent. alcohol and in one-half its vol. and more of 90 per cent. alcohol. It contains from 62 to 71 per cent. of l-carvone.—Schimmel's Rep., April, 1912, 118; from Kiserletügyi Közlemenyek (Reprint), 14.

Leaf Oil of Thuja Plicata—Yield and Properties.—According to R. E. Rose and Carl Livingston, the leaves and twigs of the Washington Cedar (*Thuja plicata*) yield about 1 per cent. of a clear, light yellow oil, with the characteristic odor of cedar boughs. The following constants were found: Sp. gr., 20° C.=0.913; refr. index 20° C.=1.4552; sp. rotation 20° C.= -4.77° ; acid number=0.518; ester number=2.28; saponification number=2.8; acetylation number=8.8. An elementary analysis showed the absence of sulphur and nitrogen, and to contain C=78.6 per cent.; H=10.4 per cent.; which agrees very closely with that of a bicyclic ketone, $C_{10}H_{16}O$. The oil contained no phenols and was soluble in all proportions of anhydrous organic solvents and in 70 per cent. alcohol. From the analytical results submitted, the authors conclude that the volatile oil cent pinene, 1-2 per cent. tanacetyl acetate, 1-3 per cent tanacetyl of *Thuja plicata* is composed of 80 to 85 per cent. thujone, 3-5 per cent. pinene, 1-2 per cent. tanacetyl acetate, 1-3 per cent. tanacetyl alcohol, leaving about 10 per cent. to be accounted for by loss due Journ. Am. Chem. Soc., Feb., 1912, v. 34, page 201. (L. A. B.)

Thymol—As a Remedy for Tape Worm.—Allan, W., reports the use of thymol for *Tænia saginata*, and believes it to be a satisfactory remedy because it is cheap, requires no preliminary starvation or purgation, and is less expensive than pelletierine.—J. Am. M. Assoc., 1912, v. 59, p. 197. (M. I. W.)

Toddalia Oil—Yield and Properties.—Brooks has distilled from the leaves of *Toddalia asiatica*, L. (Kurz) (*T. aculeata*, Pers.), a volatile oil in a yield of 0.08 per cent., having the following constants: Sp. gr., $30^{\circ}/30^{\circ}$, 0.9059; refr. index 30° , 1.4620. During cooling 18 per cent. of a substance with an odor reminding of camphor was precipitated. This was very liable to decomposition, and when recrystallized from petroleum benzin melted between 96.5° and 97° . A fraction of the oil, boiling over between 195° and 200° , contained linalool.—Schimmel's Rep., April, 1912, 121; from Philipp. Journ. of Sc., 4A. (1911), 344.

Trawas Leaf Oil—Characters and Constants.—The leaves of *Litsea odorifera*, Val., known in Java as *trawas leaves*, are in use as a popular remedy, and yield, according to van Romburgh, a volatile

oil having the following constants: Sp. gr. 15°, 0.836 to 0.846; opt. rot., $-0^{\circ} 10'$ to -7° (200 Mm. tube); the principal fraction boiled at 233° (120° to 125° at 10 Mm.), and contained several ketones and alcohols.—Schimmel's Rep., April, 1912, 121; from Reprint, Koninkl. Akad. Wetensch., Amsterdam, 323.

Turpentine Oils—Products of Oxidation by Atmospheric Air.—American oil of turpentine, pinene from the same, Russian oil of turpentine, and sylvestrene prepared from the same, were subjected by C. T. Kingzett and R. C. Woodcock to the oxidizing effect of exposure to atmospheric air, in two series of experiments: 1. By exposing the oils with an equal volume water to a current of air at 65° C. for 24 hours, and then examining the aqueous solution. 2. By exposing the oils previously dried over ignited calcium chloride, to a current of dry air at 65° to 69° C. during several weeks (when they showed the following specific gravities; Amer. turpentine oil, 0.931; pinene, 0.962; Russ. turpentine oil, 0.940; sylvestrene, 0.058), then shaking with half the volume of water, and examining the solution. The results were as follows:

First experiment. Yield of oxidation products:

	Formic Acid	Acetic Acid	Formaldehyde	Acetaldehyde
Amer. oil.....	0.017%	0.038%	indications	none
Pinene	0.14 %	0.057%	"	"
Russ. oil.....	0.026%	0.108%	"	"
Sylvestrene	0.16 %	0.086%	"	"

Second experiment. Yield of oxidation products:

	Formic Acid	Acetic Acid	Formaldehyde	H ₂ O ₂
Amer. oil.....	0.055%	0.024%	none	0.71 vol.
Pinene	0.054%	0.186%	indications	0.348 vol.
Russ. oil.....	0.13 %	0.08 %	none	1.06 vol.
Sylvestrene	0.059%	0.264%	indications	0.532 vol.

—Chem. News, Jan. 19, 1912, 26-27.

Russian Turpentine Oil—Constituents.—An abstract from a paper on "Investigation into the heart-sap of the Pine, Spruce and Fir in Russia" by J. K. Maisit, published in the Russian language, enables Schimmel & Co. to give some information concerning the as yet little known Russian turpentine oil, which is derived from white pine resin (*Pinus silvestris*, L.). The author says that although the common pine has been utilized in Russia for resin (turpentine ? Rep.) since the year 1780, colophony and oil of turpentine are also produced but not in large quantities. This turpentine oil is known in Russia by a term which, literally translated, signifies "sulphur turpentine oil." To this must be added the further fact that

pine tar oils are also brought into trade in Russia under the name of turpentine oil. The author states that Russian turpentine oil contains the following constituents: *d*-pinene, small quantities of acetone, dipentene, *l*-limonene, *i*-sylvestrene, and *d*-terpineol.—Schimmel's Rep., October, 1912, 107.

Russian Oil of Turpentine—Suspicious Quality of the Article Imported.—Ernest J. Parry, having occasion during the past twelve months to examine a large number of samples of Russian oil of turpentine, has for some time suspected that this article as known in England is not a natural product at all, but that it is a fractionated oil from which a good deal of the "middle-runings" have been removed. This belief has been amply confirmed by Professor Schindelmeier, of Dorpat University, who informs him that natural or "virgin" Russian turpentine oil never reaches England. The oil is fractionated, and the portions boiling at about the same temperature as American turpentine oil are largely removed, and used in Russia for industrial purposes, the low and high boiling fractions being then mixed and exported as Russian turpentine. Two authentic samples were placed at the disposal of Mr. Parry by Professor Schindelmeier, with the statement that normal oil contains from 40 to 70 per cent. distilling between 155° to 160°, and consisting chiefly of pinene, and that he has never met with a pure "virgin" Russian turpentine oil containing less than 40 per cent. of the hydrocarbons distilling between 155° and 160°. Examined by Mr. Parry the following figures for the two typical samples of virgin crude Russian turpentine were obtained:

	I	II
Specific gravity.....	0.867	0.865
Optical rotation.....	+7° 50'	+10°
Refractive index.....	1.4718	1.4736
Absorbed by 5% KOH.....	5%	6%
Distilled below 155°.....	traces only	traces only
“ at 155°-160°.....	65 %	63%
“ at 160°-165°.....	11 %	9%
“ at 165°-170°.....	13 %	15%
“ at 170°-180°.....	7.5%	7%
“ above 180°.....	3.5%	6%

Comparing these figures with those obtained in an examination of four of the best samples of Russian oil of turpentine available on the London market, which were selected as being more or less satisfactory, on the principle that it is the best one can get, it is evident that the Russian oil of commerce is not the natural product. But assuming this to be the type of the best quality of merchantable

oil, that is to be understood as Russian turpentine, the author considers the following figures to be fair standards to work upon:

Specific gravity.....	0.862 to 0.872
Optical rotation.....	+3° to +20°
Refractive index at 20°.....	1.4700 to 1.4750
Absorbed by 5% KOH solution.....	not more than 3%
Distils below 155°.....	not more than 1%
" " 170°.....	not less than 75%
" " 180°.....	not less than 95%

A large number of samples on the market are, however, more largely deprived of their middle runnings, and contain a considerable amount of hydrocarbons boiling over 180°, and also a considerable amount of acid bodies, which are absorbed by caustic potash. Obviously the whole question of Russian oil of turpentine, even if it comes within the description of "good merchantable quality," requires careful consideration.—Chem. and Drugg., Oct. 26, 1912, 655.

Oil of Turpentine—Adulterants and Methods of Examination.—The "Chem. Engineering and Works Chemist" (March, 1912, 13) says that the adulterants generally met with in oil of turpentine are the various distillates of petroleum (petrol, gasoline, benzoline), coal-tar naptha, and resin spirit. When adulterated with petroleum products, it generally gives a froth when the bottle containing it is shaken, and globules or beads float about on the surface of the liquid. Genuine turpentine does not give any froth or beads on shaking. The specific gravity of genuine American turpentine at 15.5° varies little from 0.866. Any sample whose specific gravity is outside the limits of 0.860 to 0.871 is certainly not genuine American. A high gravity generally indicates the presence of resin spirit or of "dead wood" turpentine. A low gravity is due to the presence of petroleum products. Genuine American turpentine flashes at 92° F. to 94° F. Any sample flashing under 90° F. should be rejected. A genuine American oil should not commence to distil until the thermometer reaches 157° C., and at least 90 per cent. should have passed over at 165°. The American oil is usually dextrorotatory, but it is by no means constant, and is sometimes even lævorotatory from particular parts. French turpentine is always lævorotatory, while Russian and Sweedish turpentines are dextrorotatory. The refractive index of genuine turpentine varies from 1.470 to 1.475 at 15.5° C. Adulterants have a lower index. If the figure for the first fraction falls below 1.470, the sample is certainly adulterated.

Polymerisation furnishes absolute positive proof of the presence or absence of petroleum products, and the process is as follows: 100 Cc. of concentrated sulphuric acid is added to 50 Cc. of water, and the mixture cooled, placed in a large stoppered flask, and 500 Cc. of the turpentine cautiously added, still keeping cool under the tap, and cautiously shaking. When no more heat is developed, even on violent shaking, the whole contents of the flask are steam distilled. The polymerised turpentine remains behind, while any petroleum adulterants pass on with the steam. The process is now repeated on the distillate, using half its volume of a mixture of four parts of concentrated sulphuric acid to one of water, and the whole bulk steam-distilled again. Finally the distillate is warmed with four times its volume of concentrated sulphuric acid at 60° C. and distilled in steam again, and the volume of the unattacked oil measured. Pure turpentine gives 1.5 per cent. of unattacked residue.—Pharm. Journ. and Pharmacist, May 18, 1912, 647.

Oil of Turpentine—Detection of Pine Oil ("Kienöl").—Dr. K. Baumann, briefly mentioning the tests of the G. P. v. for ascertaining the purity of oil of turpentine, remarks that owing to the present high price of this oil it is now frequently adulterated with the oil distilled from the wood of different species of *Pinus*, commercially known as pine oil or "kienöl," but that none of the tests serve to reveal its presence. The only characteristic distinction is the very unpleasant odor of the pine oil, but even this is subjective, and consequently not dependable. He therefore calls attention to an unmistakable test, pointed out by Herzfeld in 1905, which depends upon the production of a yellow color when pine oil is shaken with an equal volume of aqueous sulphuric acid, while turpentine oil remains colorless. It is true that by refining the pine oil, the yellow color is not so pronounced, but the refining does not completely prevent the production of the yellow color, and it is quite possible to detect its presence in the amount of 5 to 10 per cent., or more, in oil of turpentine, in case of doubt, by comparison with a blank experiment made with pure oil of turpentine. It has not yet been possible, however, to determine the body in the pine oil that is responsible for the color reaction described.—Pharm. Ztg., lvii (1912), No. 57, 575.

"Turpentine-Phosphorous Acid"—*Composition and Bio-Chemical Characters.*—According to Ernest Sieburg, who has made a biochemical study of the composition and characters of the so-called

"turpentine-phosphorous acid," the product formed by the action of phosphorous on oil of turpentine (pinene) is in reality

Terpenolhypophosphorous Acid. The analytical data obtained with the sodium, lithium, barium and lead salts lead to the assumption that it is a monobasic acid. By gentle oxidation in the test-tube it is converted into terpenol-phosphoric acid, and a similar transformation occurs in the human body; that is to say, it is eliminated from the body as turpenol phosphoric acid $P(OH)_2OC_{10}H_{17}O$. But while this behavior speaks for a true chemical combination, it also leads to the assumption that the phosphorous is firmly and directly combined with the hydrocarbon, which otherwise would be eliminated from the organism as glycuronic acid.—Pharm. Ztg., lvii (1912), No. 91, 917; from Biochem. Ztschr., 43 (1912) No. 4.

Walnut Leaf Oil—Yield, Characters and Constants.—Schimmel & Co. have distilled walnut leaf oil in two examples, the one at Miltitz, the other at Barrême. Both had an olive-brown color and the characteristic odor of walnut leaves; formed semi-solid butter-like masses at about 10° , which melted at about 20° , and from the solutions in 90 per cent. alcohol, separated large quantities of paraffin, which after repeated crystallization from alcohol had the m. p. 61° to 62° . The constants of the two oils, obtained in a yield of 0.014 per cent. at Miltitz and of 0.0087 per cent. at Barrême, were respectively as follows: Sp. gr., 20° , 0.9137 and 0.9185; opt. rot., $\pm 0^\circ$ and -17° , $0'$; refr. index, 25° , 1.49657 and 1.49215; acid val., 9.3 and ?; ester val., 27.0 and ?; ester val. after acetylation, ? and 98.5. It will be noticed that there are certain differences between the Miltitz and Barrême oils, chiefly expressed in the optical behavior, while the determination of acid and ester values are not complete for both oils.—Schimmel's Rep., April, 1912, 131.

Aromatic Compounds—Bromide Absorption Number.—While Hubl's iodine absorption number is a valuable index of quality of fats, it does not give satisfactory results with volatile oils and their congeners. The bromide absorption number has been tried in these cases with variable success in the past and now Klimont, Neumann and Schwenk claim they have placed the operation on a practical basis. After citing past literature on this subject and after giving their method-treatment of a chloroformic solution of the oil with potassium-bromide-bromate (Koppeschaar) solution, then adding sulphuric acid and 10 per cent. potassium iodide solution and finally

titrating with tenth-normal thiosulphate V. S.—they report on the following organic bodies.

Substance	No. Molecules Br. Added	Bromine Calculated	Number Found
Allyl alcohol.....		275.8	262.8
Amylene		228.6	206.8
Crotonic acid.....		186.0	185.7
Erucic acid.....		47.0	46.0
Elaidic acid.....		56.7	55.6
Camphene		117.7	118.8
Dipentene	4	235.	222 to 235.4
Geraniol	4	207.	180.
Linalool	4	207.8	169 to 186
Terpinhydrate	0	0.	1.6
Terpineol	2	103.9	108 to 109.4
Citral	4	210.5	189 to 191
Menthol	0	0.	15.6
Menthone	0	0.	16.7
Borneol	0	0.	5.1
Camphor	0	0.	0.
Phenol	6	509.8	507.8
Anisol	2	148.2	149 to 150
Phenetol (rectified).....	2	131.2	131.4 to 131.9
Eugenol	6	292.7	289.9 to 294.6
Anethol	2	108.1	122.9
Apiol	2	72	92
Cinnamic alcohol.....	2	119	121.3
Cinnamic aldehyde.....	2	121	121.

Unsatisfactory figures were obtained from isoprene, commarin, vanillin, heliotropin and cumanic acid. As to the turpentine oils, while the theoretical figure (for pinene) is 235, Austrian oils run from 234.3 to 236.8; French, 244.1 to 244.9; American, 244.9; while Russian "Kienöl" are irregular, running from 113.2 to 201.5. Petroleum distillates (fraction boiling between 160° and 170°) as would be expected, absorb no bromine and mixtures of turpentine with petroleum products are correspondingly low; under 104. Fats give as satisfactory bromine numbers as they do iodine numbers.

Among the theoretical conclusions reached by the investigators are, (1) The bromine numbers cited above are obtained in aqueous mixture and represent additions of bromine to unsaturated compounds; not substitution products. (2) All unsaturated compounds do not add bromine with equal ease. (3) Such compounds having two carboxyl groups do not add theoretical amount of bromine and steric relationship—as in fumaric acids—influences absorption. (4) The aliphatic terpenes show irregularity in bromine absorption, due partly to ring formation, to hydrolysis (if H_2SO_4 be present) or to formation of HBr . (5) Cyclic terpenes with one double bond absorb bromine in molecular proportions. (6) Those with para-diagonal bond absorb no bromine, but those with meta-diagonal bond absorb bromine in molecular proportions and that representing two or four atoms bromine according to experimental conditions. (7) Therefore, different turpentine oils have different bromine figures but as shown in the table given above, each kind of turpentine oil has a constant bromine factor. (8) Phenols add 6 atoms Br and use up 3 atoms Br in formation of hydrobromic acid and in practice the bromine number is not satisfactory. (9) Benzol derivatives with unsaturated side chains as a rule give accurate bromine number. (10) Much of the irregularity of former bromine numbers comes from the fact that some of the so-called absorbed bromine represents split off HBr , which has been considered as bromine taken up by the organic chemical by substitution. This, the writers show by experimental data representing the HBr (separated as $AgBr$) obtained from the mother liquor after separation of the true bromine compounds of phenol and anisol.—Arch. d. Pharm., 250 (1912), No. 8, 561. (H. V. A.)

ALCOHOLS AND DERIVATIVES.

Dihydric Alcohols—A Homologous Series in Plants of the N. O. Cucurbitaceae.—In his paper on the constituents of cucurbitaceous plants (which see under *Materia Medica*) Dr. F. Power directs attention to a group of dihydric alcohols forming a homologous series, represented by the general formula $C_nH_{2n}-8O_4$, which have been isolated from different plants of that natural order in the Wellcome Chemical Research Laboratories, London. These comprise "ipurganol," from jalap resin; "grindelol," from the resin of *Grindelia camporum*, Greene; "cucurbitol," from water melon seed; and "bryonol," from bryony root.—Amer. Journ. Phar., April, 1912, 154.

Artificial Esters—Manufacture and Description of Commercial Kinds Used in Perfumery and for Flavoring Purposes.—At the 1912 meeting of the British Pharmaceutical Conference, John C. Umney and C. T. Bennett contributed a paper on the commercial esters used in perfumery and for flavoring purposes which contains much useful information regarding the method of manufacture of these esters, their commercial quality, chemical examination, characters, and constants. These esters are usually made on a large scale, either by distilling the anhydrous alcohol and the proper acid (in concentrated form, or a salt may be used), together with a dehydrating agent such as sulphuric acid; or by dissolving the acid in the alcohol and passing hydrochloric-acid gas through the solution. The successful production of pure products depends largely on the careful purification of both acids and alcohols, especially in the case of amyl alcohol and butyric acid. The great variation in commercial esters is reflected very largely by the differences in prices asked for them. The result of the examination of the various commercial esters as compared with pure esters are given in the form of a table, exhibiting their constants, and in the following summary:

Ethyl Acetate, commonly known as acetic ether, is a constituent of many fruit-essences, notably strawberry, raspberry, cherry, pear, plum, and peach. There are several commercial varieties, which are sold according to specific gravity. The density of the pure product reaches 0.907 to 0.908, and those below this contain alcohol. The boiling range should not be outside the limits 74 to 79, and the solubility should be 1 in 9 at 15° C. The proportion of true ethyl acetate present may be determined by shaking a known volume with a saturated solution of calcium chloride, also saturated previously by shaking with ethyl acetate. The diminution in volume will indicate the proportion of water and alcohol.

Ethyl Formate enters into the composition of raspberry, strawberry, and peach essences. Commercial samples have a rather high acidity, and frequently contain free alcohol as well, evidently owing to dissociation. Freshly prepared samples have a density of 0.919 and distil between 54° and 55° C. One trade sample contained only 5 per cent. of ethyl formate, and another 16.4 per cent. These were evidently solutions in alcohol.

Ethyl Butyrate, or butyric ether, is one of the constituents of essences of pineapple, apricot, melon, peach, and strawberry. The pure substance has a density of 0.883 and a refractive index of

1.392 It boils between 110° and 120° C. Commercial esters frequently contain alcohol.

Amyl Acetate is the chief constituent of essence of pear. The specific gravity of the pure compound is 0.876, and it boils at 137° to 139°. Prepared from purified amylic alcohol obtained from fusel oil, the range of boiling-point is somewhat wide, but it should distil almost entirely between 120° and 140° C. It consists chiefly of iso-amyl acetate, but other isomeric acetates are present, the boiling-points of which are as follows:

Normal amyl acetate.....	147° to 148°
Methyl propyl carbinyl acetate.....	133° to 135°
Methyl iso-propyl carbinyl acetate.....	125°
Diethyl carbinyl acetate.....	132°
Tertiary amyl acetate.....	124°

Amyl Butyrate enters into the composition of artificial essences of pineapple, raspberry, strawberry, and cider. The pure substance has a density of 0.867, a refractive index of 1.4128, and boils at 170° to 180° C. Commercial esters generally contain free amylic alcohol, which causes irritation when inhaled.

Amyl Valerianate, or apple oil, when chemically pure, has a density of 0.858, refractive index 1.413, and range of boiling-point from 180° to 190° C. Commercial products have a range of boiling-point from 140° to 190° C.

Sebacic Ether is the chief constituent of essence of melon.

Ethyl Salicylate has an odor resembling wintergreen, but more delicate and pleasant.

Amyl Salicylate is used in perfumery as a basis for clover perfumes.

Ethyl Benzoate and *Ethyl Cinnamate* are used in perfumes such as new-mown hay and meadowsweet. Having a high boiling-point, they also serve as fixatives.

Amyl Benzoate has an anise-like odor.—Trans. Br. Pharm. Conf (Yearbook of Pharmacy), 1912, 413-417.

Alcohol—Sources and Estimated Yield.—In an article on "Alcohol" published in the Kew Bulletin, No. 3, 1912, J. H. Holland reviews the sources whence alcohol is obtained and mentions the estimated yield from the material used, which he divides into: (1) Fruits; (2) Roots, Tuberous Roots, and Root-stocks; (3) Grain; (4) Stems; (5) Leaves; (6) Inflorescences; and, as sources of methyl alcohol, (7) Wood or Woody Substances; (8) Peat. This

valuable compilation will be consulted with great interest by those engaged in the industry, but it must suffice here to simply mention the different materials with the estimated yields of alcohol from them, or the special uses of the products obtained.

The grape (*Vitis vinifera*, L. var.) yields fresh, per ton, from 21 to 22 gallons of alcohol; raisins, an average of 145 gallons of proof spirit per ton, and dried currants, 100 liters of alcohol from 600 lbs.

Apples (*Pyrus malus*, L. var.) are capable of yielding about 14 gallons of alcohol per ton.

Cherries (*Prunus cerasus*, L. var.) yield about 3 to 4 liters of pure alcohol per 100 kilos, or 7 to 8 liters of "Kirsch" at 55°.

Bananas (*Musa sapientum*, L.) are estimated to yield 4½ liters per bunch.

Pineapples (*Ananas sativus*, Schult. f.) yield considerable waste-material that might be used for preparing alcohol.

Potatoes (*Solanum tuberosum*, L. var.) yield about 25 gallons of alcohol (44 gallons of proof spirit) per ton.

Beets (*Beta vulgaris*, Lin. var.) may yield an average of 18 gallons of proof spirit per ton.

Sweet Potatoes (*Ipomoea batatas*, L.) yield approximately 38 gallons of alcohol per ton.

Artichokes (*Helianthus tuberosus*, L.) are estimated to yield about 25 gallons per ton.

Barley (*Hordeum vulgare*, L.) contains 58.9 per cent. of starch, but is rarely used by itself for producing alcohol, being added to other grains as a convenient medium, in the form of malt, to convert starch into sugar, preparatory to fermentation and distillation.

Rye (*Secale cereale*, L.) with a content of 53.7 per cent. of starch, rarely yields over 85 gallons of alcohol per ton.

Maize (*Zea mays*, L.) contains 64 per cent. starch. One ton (U. S.) of grain, made up of 1850 lbs. of maize and 150 lbs. of malt, is calculated to yield 100 gallons of alcohol.

Rice (*Oryza sativa*, L. var.) contains nearly 78 per cent. of fermentable matter and is the source of the "Sake" of Japan and of the "Arrack" of India, but is not a source of industrial alcohol.

Sugar-Cane (*Saccharum officinarum*, L.) yields 70 per cent. of juice (in Mexico); giving 9 to 10 per cent. of alcohol.

Sugar-Corn stalks (*Zea mays*, L.) contain from 7 to 15 per cent. of sugar, and are capable of yielding 6 to 10 per cent. of alcohol.

Sorghum stalks (*Sorghum saccharatum*, Moench. var.), containing 14.42 per cent. of sucrose and 1.1 per cent. of reducing sugars is calculated to yield $12\frac{1}{2}$ gallons of 180° alcohol from 1000 lbs., and possibly more from cleaned stalks.

Utschkin (*Heracleum Sphondylium*, L.) is utilized in Russia, etc., for the preparation of alcoholic beverages from the petioles after they have been deprived of the outer skin, which is poisonous.

Pulqua Maguay juice (*Agave atrovirens*, Karw.) is recommended as a source of industrial alcohol.

Regarding the sources of *Methyl Alcohol*, the author states that a yield of 8 to 10 gallons may be obtained per cord from beech, oak, thorn, (*Crataegus oxyantha*, L.), birch, and maple wood, while pine-wood will yield only about 3 gallons per cord (128 cubic feet).—*Pharm. Journ. and Pharmist*, May 4, 1912, 569-570.

Alcohol—Assay by Evaporation Method.—Claude Mason, state chemist of Idaho, reviews the different methods of alcoholic assay and recommends the following method as one of easy application by pharmacists in determining the alcoholic content of their preparations. The specific gravity of the sample is determined. Then 50 to 100 Cc. is carefully evaporated to about one-fourth of its original volume. This is returned to the measuring flask and distilled water is added sufficient to make it of its original volume. The specific gravity of this is then taken. Add one to the specific gravity of the original sample and subtract the specific gravity of the de-alcoholized product from this and the difference corresponds to the specific gravity of the alcoholic sample. The per cent. of alcohol is then found by referring to the specific gravity tables of the Dispensary, all taken at 60° F. or 15.6° C.—*Proc. Idaho Pharm. Assoc.*, 1912, pp. 22, 23. (E. C. M.)

Rum—Examination of Supplies for the German Military Establishment.—H. Strunk has found the supplies of rum for the German military establishment to consist uniformly of "blends," as evidenced by the low ester and acid contents, but was unable to determine the proportions of the higher alcohols with certainty. According to the observations of v. Fellenberg the higher alcohols of genuine rum consist mainly of normal butyl alcohol, and this is confirmed by Strunk's experiments. The determination of this alcohol, by the shaking out process of Röse (with chloroform) and the values obtained by the color reactions (according to Komarowski) afford

valuable criterions of genuineness for Jamaica Rum.—Pharm. Ztg., lvii (1912), No. 18, 176.

Ether Decomposition Products.—An explosion during distillation of ether in his laboratory, led George Kassner to study its causes by examination of a sample of the ether used in the experiment. He found it did not contain hydrogen dioxide as was the case with an explosive ether examined by Schaer (absence due possibly by use by Kassner of NaOH for drying his ether and absorption of the H_2O_2 by the alkali); that it did contain vinyl alcohol as already noted in ether by Poleck and Thummel (proven by precipitation on addition of Nessler's Reagent), and that the explosion was not due to vinyl alcohol which distils at 33° with no difficulty whatever. Kassner raised the question whether the explosion with the ether used was not due to an organic peroxide $(C_2H_5)_2O_2$, a question which he could not answer because of lack of necessary material.—Arch. d. Pharm., 250 (1912), No. 6, 436. (H. V. A.)

Ethyl Ether—Determination of the Specific Gravity.—George D. Rosengarten describes the following method for the determination of the specific gravity of ethyl ether, which in practice has given results varying not more than two points in the fourth decimal place. Employing a calibrated pyknometer of 25 Cc. capacity (shown in a cut accompanying the original), its capacity for water at 25° C. up to a convenient mark on the stem, is first ascertained. The pyknometer is then filled with ether to a little above the mark and placed in a 1000 Cc. beaker containing water which is carefully kept at 25° C. and constantly timed with a thermometer. When the volume of ether becomes constant in the pyknometer the excess of ether is removed by means of a capillary pipette until the desired mark is exactly reached. The pyknometer is then quickly dried with soft flannel or filter paper and weighed.—Amer. Journ. Pharm., Sept., 1912, 398-399; Journ. Industr. and Engin. Chem., Vol. 3, No. 11.

Ether—Solubility in Normal Saline Solution.—The intravenous administration of ether dissolved in normal saline solution has recently engaged the attention of anæsthetists and some experiments have therefore been undertaken by R. R. Bennett to determine the solubility in normal saline solution of pure ethyl oxide and pure "methylated" ether which is in general use for anæsthetic purposes. The results are given in the following tables:

Table A. Solubility of Pure Ethyl Oxide in normal saline solution.

Temperature, Degrees Centigrade	Grams of Ethyl Oxide dissolved by 100 grams of Normal Saline	Cc. of Ethyl Oxide (at 15° C.) dissolved by 100 Cc. of Normal Saline
0°	13.08	18.27
5°	11.15	15.58
10°	9.45	13.20
15°	8.10	11.31
20°	6.87	9.60
25°	5.96	8.33
30°	5.30	7.40

Table B. Average solubility of several samples of Commercial Purified Ether prepared for anæsthetic purposes from methylated spirit.

Temperature, Degrees Centigrade	Grams of Ether dissolved by 100 grams of Normal Saline	Cc. of Ether (at 15° C.) dissolved by 100 Cc. of Normal Saline
0°	13.46	18.80
5°	11.55	16.14
10°	9.87	13.79
15°	8.50	11.87
20°	7.38	10.31
25°	6.46	9.02
30°	5.83	8.14

—Trans. Brit. Pharm. Conf., (Yearbook of Pharmacy), 1912, 481-488.

Calcium Ethylates—Formation—M. de Forcrand finds that when alcohol reacts with a metal of the alkaline earths, or with a hydride, acetylide, or amide of such a metal, an ethylate is obtained, that of calcium for example, having the composition $(C_2H_5O)_2.Ca$. These ethylates show a great tendency to fix excess of alcohol. Thus a compound of the formula $(C_2H_5O)_2.Ca.2C_2H_6O$ is readily formed, and if attempts are made to remove the excess of alcohol from this, five distinct modifications may be obtained, having the following compositions respectively: $3C_2H_6O.CaO$; $4C_2H_6O.3CaO$; $C_2H_6O.CaO$; $C_2H_6O.2CaO.2H_2O$; $C_2H_6O.3CaO.2H_2O$. —Chem. News, Febr. 9, 1912, 70; from Compt. rend. 153, No. 26.

Ether and Chloroform—Development of Heat on Mixing.—During the estimation of total alkaloids in ipecacuanha by the French Pharmacopœia's method, Mme. Marcelet and H. Marcelet observed the development of heat, quite perceptible to the hands, on mixing ether and chloroform. Following up this observation for the purpose of discovering the effects on mixing the two liquids in varying proportions, using the pure liquids—the chloroform carefully freed from alcohol—kept at the same temperature, the authors found that in a mixture of 5 Cc. of ether and 45 Cc. of chloroform the temperature rose from the initial figure of 16.55° to a maximum of 21.5° ; a mixture of 10 Cc. and 40 Cc., respectively, rose from 16.6° to a maximum of 25.5° ; 15 Cc. and 35 Cc., from 16.6° to 27.6° ; 20 Cc. and 30 Cc., from 16.6° to 29.65° ; and 25 Cc. of ether and 25 Cc. of chloroform, from 16.6° to 30.3° . With higher proportions of ether the rise diminished from 29.4° almost by the same gradation until 21.6° was reached with 45 Cc. of ether and 5 Cc. of chloroform. That is to say, the elevation and decrease corresponded exactly.—Pharm. Journ. and Pharmacist, Dec. 7, 1912, 711; from Bull. Sci. Pharmacol, Nov., 1912, 676.

Chloroform—Fatalities from.—Monroe, P. W., discusses chloroform fatalities and reports six cases of sudden death which occurred during the early stages of anæsthesia.—J. Am. M. Assn., 1912, v. 58, pp. 89-90. (M. I. W.)

Paraldehyde—Estimation of Acidity and Acetaldehyde.—While the G. P. V. defines paraldehyde to be a "clear, colorless liquid, containing about 4 per cent. of acetaldehyde," it gives tests which do not correspond with a paraldehyde containing 4 per cent. of acetaldehyde. Moreover, the pharmacopœia is silent regarding the acidity, although all paraldehydes have an acid reaction, which increases by age and has the effect of vitiating the test by consuming a portion of the liberated alkali before its titration with HCl. After a comprehensive study, E. Richter finds that paraldehyde should not contain more than 0.3 per cent. of acetic acid, and need not contain more than 0.5 per cent. of acetaldehyde, since it is quite possible to obtain such paraldehyde on the market, as shown by the analytical results obtained with commercial samples. If, however, the G. P. persists in admitting paraldehyde containing as much as 4 per cent. of acetaldehyde, the tests should be carried out as follows:

Ten Gm. of paraldehyde are dissolved in 100 Cc. of water by agitation; 2 drops of phenolphthalein solution are added, followed by KOH solution, drop by drop, until the last drop produces a red color.

For this purpose not more than 0.5 Cc. of normal KOH solution should be required, indicating a maximum content of 0.3 per cent. of acetic acid (1 Cc. N-KOH solution=0.06003 Gm. acetic acid). Now, 20 Cc. of sodium sulphite solution (25 Gm. of crystallized salt in 100 Cc. of water) are added, and the mixture is titrated with normal HCl until completely decolorized. The amount of normal HCl required to decolorize a mixture of 20 Cc. of the same sodium sulphite solution and 100 Cc. of water containing two drops of phenolphthalein solution is then ascertained, and deducted from the amount first obtained. The remainder should not exceed 9.1 Cc. normal HCl, indicating a maximum content of 4 per cent. of acetaldehyde; or not more than 1.15 Cc. if the sample contains only 0.5 per cent of acetaldehyde (1 Cc. normal HCl=0.044 Gm. acetaldehyde). As the result of his experiments, the author feels justified in recommending the following pharmacopœial definition for a good paraldehyde: Sp. gr., 0.998-1000; acidity, 0.3 per cent; acetaldehyde, 0.5 per cent; metaldehyde (not heretofore considered), 0.1 to 0.2 per cent.—Pharm. Ztg., lvii (1912), No. 13, 125.

Chloral—Detection in Presence of Chloroform.—Jonas finds the ordinary reaction insufficient for the detection of chloral in mixtures containing also chloroform and recommends the following test which permits the detection of 0.00025 Gm. of chloralhydrate in 5 Cc. of solution: The solution is faintly acidulated with diluted H_2SO_4 in a flask closed with a tuft of cotton, an excess of zinc dust is added, and the flask allowed to stand without heating until gas ceases to be evolved. The cotton tuft is then removed and a piece of freshly prepared sodium nitroprusside paper, moistened with a few drops of 5 per cent. piperidine solution is attached. The tuft is returned to the flask which is now heated. In the presence of chloral the paper is turned blue by the vapor of acetaldehyde which is now evolved by the reduction of the chloral. It is true that all substances evolving the aldehyde by the reaction with Zn and H_2SO_4 , produce the same color reaction, but in most cases the chloral can be separated from these by distillation in a current of steam.—Pharm. Journ., lvii (1912), No. 64, 644; from Chem. Ztg., July, 1912.

Chloral Hydrate—Compounds with Urotrophine and with Caffeine.—A. Leulier finds that chloral hydrate in strong aqueous solution combines with urotrophine and with caffeine to form monochloral and dichloral compounds, according to the quality of the base present.

Monochloral-Urotropine ($C_2HCl_3O \cdot H_2O$) $(CH_2)_6N_4$, is formed as a precipitate of crystalline needles when equi-molecular weights of the two constituents in aqueous solution are mixed. These are slowly transformed into rhomboidal crystals. The latter are formed at once when two molecules of chloralhydrate are made to react on one molecule of urotropine.

Dichloral-Urotropine $(C_2HCl_3O \cdot H_2O)_2 (CH_2)_6N_4$, is obtained in a similar way, in needles, by using two molecules of urotropine and one molecule of chloral hydrate.

Dichloral-Caffeine $(C_8H_{10}N_4O_2 \cdot H_2O) 2(C_2HCl_3O \cdot H_2O)$, is obtained by rapidly saturating a 1.5 aqueous solution of chloral hydrate in the cold with caffeine, and allowing it to crystallize in a close vessel. When the precipitate no longer increases it is collected and drained. After one or two days in the desiccator it melts at 71° - 72° C.

Monochloral-Caffeine $(C_8H_{10}N_4O_2 \cdot H_2O) (C_2HCl_3O \cdot H_2O)$, is formed from the dichloral compound by the gradual loss of chloral, and melts at a temperature of 92° - 93° C when the conversion is completed.—Pharm. Journ. and Pharmacist, July 27, 1912, 99; from Journ. de Pharm. et Chim., 1912, 6, 18.

Acetone—Tests.—Rosenbloom, Jacob, points out that in the presence of protein, Lieben's and Gunning's test for acetone are negative and require the use of distillate for positive results. He also calls attention to the Frommer test which can be applied to the urine direct and does not react with diacetic acid if the heating is not carried too high.—J. Am. M. Assoc., 1912, v. 59, p. 445. (M. I. W.)

Acetone-Alcohol.—According to Merck's Annual Report (1911), this is a mixture of 30 parts acetone and 70 parts alcohol 95 per cent. It possesses highly disinfectant and antiseptic properties and is used for cleansing hands or wounds.—Ph. Zhalle, 1912, 1162. Editor's Comment: Great caution should be exercised when this mixture is called for by physicians or on prescriptions. It **has** been the habit of some druggists to label purified deodorized methyl alcohol as *Acetone Alcohol*, which, however, is a wrong name, as Columbian spirit, etc., is entirely free from actone. This is another proof that methyl alcohol in any form should be labeled "Poison," and that it should not be mislabeled "Acetone Alcohol," which, according to the abstract, is an entirely different article. (O. R.)

Methyl and Ethyl Alcohols—Chemical Action.—H. von Liebig notes that the universal use of methyl and of ethyl alcohol as solvents and crystallization media for organic substances is apt to produce errors in results unless due consideration is taken of possibilities of chemical combinations of the substance with the solvent. Among such chemical combinations he cites (1) Ethers of 2-4 Dioxytriphenylcarbinols, (2) Diacetyl-resorcin-benzein (Methyl alcohol compound m. p. 122; ethyl alcohol compound, m. p. 147), (3) Fluorescein, a dark red dye, separates from methyl alcohol solution in bright yellow crystals containing 1 molecule CH_3OH .

The writer does not consider these combinations merely as alcohol of crystallization, but believes the connection is more intimate and he discusses possibilities of chemical combinations, illustrating with numerous graphic formulæ. In closing, he raised the question as to whether Willstatter's chlorophyll-alcohol combinations may not be similarly explained without recourse to the enzyme or catalyser theory.—Arch. d. Pharm., 250 (1912), No. 6, 403. (H. V. A.)

Methyl Alcohol—Detection in Alcohol.—C. Nakai recommends the following: A mixture of 3 Cc. of the liquid, 2.5 Gm. ammonium persulphate and 8 Cc. of a 20 per cent. sulphuric acid is diluted with water to 50 Cc. and is then distilled. Five distillates of 5 Cc. each are collected separately and two drops of Fuchsin-sulphuric acid are added and also 2 Cc. of a solution of Stannostannic chloride. The more methyl alcohol present, the deeper will be the blue or violet blue color. With this test methyl alcohol can be detected if present 1 in 10,000.

The Fuchsin-sulphuric acid solution is prepared by mixing 50 Cc. of a saturated sodium bisulphite solution with a solution of 1 Gm. of Fuchsin in 1 liter of water, acidified with 1 Cc. of concentrated sulphuric acid.—Yakugakuzasshi, 1912, No. 364. (O. R.)

Methyl Alcohol—Detection in Alcoholic Preparations.—A. Hellriegel, after discussing various methods for the detection of methyl alcohol in ethyl alcohol and its preparations, recommends the following simple method as being particularly suitable for the use of pharmacists. The preparation is subjected to distillation and the distillate is fractionated, the portion distilling at 64° to 67° containing the methyl alcohol. This fraction is then boiled for three hours, under a reflux condenser, with one-half its weight of quicklime, whereby the greater part of water that may be contained in it combines with the lime. The condenser is then reversed and the

distillate collected in a dry flask, whereupon the boiling point of the fraction is determined. Pure oxalic acid, dried at 100° , is now dissolved in the distillate, and the solution is boiled about one hour, when, upon cooling, oxalic acid dimethyl ester crystallizes out. The crystals are collected on a suction filter and their melting point, which should be 54° , is determined. The corresponding diethyl ester being a liquid, the methyl alcohol is thus characteristically differentiated from ethyl alcohol.—Pharm. Ztg., lvii (1912), No. 1, 7.

Methyl Alcohol—Detection in Ethyl Alcohol.—Referring to the above method for the detection of methyl alcohol in alcoholic preparations proposed by Hellriegel, C. F. Reichhardt suggests an equally simple reliable method which depends on a color reaction produced by means of oxalic acid and sodium alizarinsulphonate on the respective alcohols, provided that the distillate contains not less than 90 per cent. of ethyl alcohol. The test is carried out as follows: To 2.5 Cc. of the distillate, 1 Cc. of NaOH (G. P. solution) is added, followed by 3 drops of a 1 per cent. solution of sodium alizarinsulphonate, and the test-tube is rotated until a *clear, blue-violet* mixture results. Then 0.3 to 0.35 Gm. of dry oxalic acid is added, and the mixture vigorously shaken several times. If alcohol alone is present, the color remains unchanged; but in the presence of methyl alcohol a dirty violet colored precipitate, of gelatinous consistence, forms on the walls of the test tube, changing to a yellow color in the course of a few hours.

Another equally effective method is proposed by Dr. Aufrecht, who refers also to that proposed by Hellriegel. This method is based on the observation of A. Trillat that when methyl alcohol is oxidized with potassium dichromate and sulphuric acid, methylal ($\text{CH}_2\cdot\text{OCH}_3\cdot\text{OCH}_3$) is formed, and this, when heated with dimethylaniline, yields "tetramethyldiamidodiphenylmethane," which by oxidation, even in great dilutions, develops a magnificent blue color, becoming more intense on heating, while the blue color produced with ethyl alcohol under the same conditions disappears rapidly on heating.—Pharm. Ztg., lvii (1912), No. 4, 32.

Methyl Alcohol—Detection in Presence of Ethyl and Other Alcohols.—After reviewing different methods for the detection and estimation of methyl alcohol in presence of other alcohols and particularly of ethyl alcohol, Dr. Hugo Kühl recommends that published by Deniges several years ago (see Proceedings, 1910, 334). This method is based upon the conversion of the alcohols present in a mixture into aldehydes by oxidation with permanganate, and the

development of a violet color in presence of even traces of formaldehyde on addition of fuchsin-sulphurous acid, which is not affected by the other aldehydes even when present in large quantities. The method is conducted as follows: Into a capacious test-tube place 0.1 Cc. of the liquid to be examined (using in the case of tinctures the first portion of distillate passing), add 5 Cc. of solution of potassium permanganate (1:100) and 0.2 Cc. of concentrated sulphuric acid (accurately measured), and shake thoroughly. After standing two or three minutes, 1 Cc. of solution of oxalic acid (8:100) is added and the mixture again shaken, whereby it is decolorized rapidly, assuming a "Madeira-yellow" tint. The addition of 1 Cc. of concentrated sulphuric acid and again shaking completes the decoloration, and if new 5 Cc. of fuchsin-sulphurous acid (rosaniline bisulphite) is added, the decolorized liquid gradually assumes a violet color if methyl alcohol was present in the liquid under examination, reaching maximum intensity in about 15 minutes. The presence of 10 per cent. methyl alcohol gives an intense coloration; 1 per cent. gives a deep violet color, and 0.1 per cent. still gives a distinct violet coloration.—Pharm. Ztg., lvii (1912), No. 34, 341-342.

Methyl Alcohol—Expeditious Detection in Pharmaceutical Preparations.—Franz Lörinsch proposes the following simple and quick method for the detection of methyl alcohol in pharmaceutical preparations, such as spirits, fluid extracts, tinctures, etc.: Having eliminated iodine, if present, by decolorization with thiosulphate, or free ammonia by acidulation with sulphuric acid, the preparation is subjected to distillation. To 1 Cc. of the distillate 1 Cc. of 25 per cent. dilated sulphuric acid and 8 Cc. of 1/10 N potassium permanganate solution are added, the mixture allowed to stand about ten minutes, and filtered; 1 Cc. of the filtrate is then mixed with 1 Cc. of a 3 per cent. solution of iron albuminate, and 2 Cc. of concentrated sulphuric acid is carefully added, whereupon an intense violet colored ring is developed at the zone of contact of the two liquids due to the presence of formaldehyde produced from methyl alcohol contained in the preparation under examination. In this test the alluminate of iron may be replaced by 1 Cc. of a mixture of equal parts of milk and water to which one drop of solution of ferric chloride has been added.—Pharm. Ztg., lvii (1912), No. 72, 727; from Ztschr. des Allg. Oesterr. Apoth. Ver., 1912, No. 35.

Methyl Alcohol—Toxicity.—In a paper read before the British Pharmaceutical Conference, Thomas Tyrer and F. C. Gosling ob-

serve that the toxicity of methyl alcohol is now placed beyond doubt. Attempts to ascribe the toxic quality to other constituents of commercial methyl alcohol and wood naphtha have failed, and there is no doubt that methyl alcohol is itself toxic.—Trans. Brit. Pharm. Conf. (Yearbook of Pharm.), 1912, 434.

Methyl Alcohol—Toxicity.—Dr. Walther Hausmann reviews the literature on this important and timely subject. As early as 1869 Richardson gave out his law that the toxicity of the alcohols increase according to their molecular weights, which are as follows:

Methyl alcohol.....	32
Ethyl alcohol.....	46
Propyl alcohol.....	60
Isopropyl alcohol.....	60
Isobutyl alcohol.....	74
Amyl alcohol.....	88

The toxicologist, Lewin, however, found that methyl alcohol is more poisonous than ethyl alcohol according to experiments on animals. I. Harnack explains this by the oxidation to formic acid in the organism. Birch-Hirschfeld proved the paralyzing effect of methyl alcohol on the optic nerve. The author reviews the use of methyl alcohol in the industries and also the cases of poisoning in Russia, Hungary, Germany and America.—Ph. Post, 1912, No. 30, 317-319. (O. R.)

Methyl Alcohol—Toxicity.—Prof. E. Harnack claims that methyl alcohol is *slowly* oxidized in the animal and human body to formic acid which can be detected in the urine. Among its homologues, formic acid is the most toxic, because it is at the same time an aldehyde and especially on account of the law that the toxicity of an organic acid *decreases* with the number of carbon atoms. This is in direct opposition to the alcohols, the toxicity of which *increases* with the number of carbon atoms. The author has proven this by a series of animal experiments. Harnack explains the difference in the toxicity of formic acid and methyl alcohol as follows: When formic acid is taken internally it is combined with bases and the resulting formates are decomposed or are eliminated in the urine. On the other hand methyl alcohol is very rapidly absorbed by the central nervous system and especially by the optic nerve. Through the slow oxidation to formic acid, these parts are inflamed and even paralyzed. This slow oxidation is also responsible for the severe pain connected with the paralysis. The toxicity of methyl alcohol is more severe on the human body than in animals.—Deutsch. Med. Wochensh., 1912, 358. (O. R.)

Wood Alcohol—Toxic Properties of.—An editorial (J. Am. M. Assoc., 1912, v. 59, pp. 200-201), points out that the widespread discussion which followed the series of deaths in Berlin as a consequence of the drinking of liquors contaminated with wood alcohol has again attracted attention to the scientific aspects of the toxicity of methyl alcohol. Observations recently reported appear to indicate that when reasonable doses of methyl alcohol are administered to animals the participation in metabolism scarcely exceeds three per cent. of the total exchange of material, and the elimination of methyl alcohol from the body is distinctly delayed, so that repeated ingestion of considerable doses of methyl alcohol may lead to a dangerous accumulation thereof in the body. (M. I. W.)

Wood Alcohol Poisoning.—Casey A. Wood (J. Am. Med. Assoc., 1912, v. 59, pp. 1962-1966) calls renewed attention to the danger of death and blindness from wood alcohol poisoning, and points out that thirty years ago poisoning from wood alcohol was practically unknown. With the elimination of the disgusting odor and vile taste of the preparation as then known and the introduction of the refined product, under various trade names, the preparation began to have more extended use and was freely advertised as a harmless and efficient substitute for grain alcohol. Wood calls attention to previously reported cases and adds a number of recent cases of poisoning from the internal use as well as from the inhalation of the fumes of wood alcohol. He also calls attention to the fact that "Columbian Spirits" and other dangerous forms of "deodorized" or purified makes of wood alcohol are freely sold in drug stores not infrequently to the exclusion of the less objectionable denatured alcohol. (M. I. W.)

An editorial (*Ibid.*, pp. 1974-1975) calls attention to some of the recent work on the relative toxicity of ethyl and methyl alcohol and the reasons for the evidently selective destructive action of methyl alcohol on highly differentiated nerve structures. (M. I. W.)

Methyl Alcohol—Toxicity.—The notorious Berlin catastrophe, whereby about 100 persons lost their lives from drinking whiskey adulterated with methyl alcohol and the resulting court trials of Scharmach have caused a great many comments in the literature. Ludwig Kroeber, Munich, after numerous experiments, does not think that the toxicity is due to the resulting oxidation products as formaldehyde, formic acid and carbon dioxide, in the organism. He believes that during the manufacture and purification the extremely poisonous methyl sulphate is formed, which easily distils and cannot

be detected by its odor. Dimethyl sulphate causes death by mere inhalation. Kroeber seems to be under the impression that the methyl alcohol in the Berlin catastrophe contained dimethyl sulphate, especially on account of the symptoms produced and he recommends the application of tests for this extremely poisonous substance. He also comments on the new German Methyl Alcohol law and recommends the salting out of volatile oils, esters, etc., which might contain the methyl radical, before the test, as advised by the Technical Examination Bureau of the Treasury. Through the new law the preparation of galenicals, etc., with methyl alcohol by unscrupulous manufacturers is done away with for the betterment of pharmacy and the public.—Ph. Zhalle, 1912, No. 30, 825-828. (O.R.)

Methyl Alcohol—Toxicity.—In addition to the Berlin catastrophe other cases of poisoning by methyl alcohol, either by internal and external use, or by inhalation, etc., are quoted from Germany, Hungary, Russia, and the United States. Statistics by Buller, Casey and Wood in the latter country show 280 cases of poisoning, resulting in blindness or death. Dr. Rudolf Fœrster writes on the action of methyl alcohol, generally producing atrophy or paralysis of the optic nerve. Strange to state, however, that large quantities of methyl alcohol have but very little effect on some persons, while small amounts will prove fatal to others.—Ph. Zhalle, 1912, No. 2, 46. (O. R.)

Methyl Alcohol—Toxicity of Wood Alcohol and Pure Methyl Alcohol.—In the discussion on a paper before the eighty-fourth meeting of the German Naturalists at Münster, Prof. Ziemke of Kiel, stated his physiological experiments on dogs with ordinary and pure methyl alcohol. When the former was administered the animals died in a short time, but did not die until after the lapse of several months when pure methyl alcohol was administered. He forms the conclusion that the Berlin catastrophe was due to the impurities in the methyl alcohol. (During the Scharmach trial it was proven that one carboy of impure methyl alcohol had been supplied by mistake.—O. R.)—Ph. Ztg., 1912, No. 76, 765.—(O. R.)

Methyl and Ethyl Alcohol—Comparison in Toxicity.—Prof. Dr. Alexander Langgaard made extensive physiological experiments on guinea pigs. He began with doses of 3 Cc. per kilo and gradually increased same to 8 Cc. until death occurred. In order to determine the single lethal dose he gave 10 Cc. of methyl alcohol, per kilo, to six guinea pigs, and 10 Cc. of ethyl alcohol to six others. Both alcohols were diluted with equal parts of water. To his sur-

prise all six animals which received ethyl alcohol were dead the next morning, while only one quinea pig died which received methyl alcohol. Even 14 Cc. of methyl alcohol per kilo did not kill the animals until the fourth day. Langgaard reaches the following conclusions: Small doses, which are repeated daily, of methyl alcohol are more toxic than ethyl alcohol, but in large single doses ethyl alcohol is more toxic than methyl alcohol.—Berl. Klin. Wochschr., No. 36. (O. R.)

Formaldehyde—Methods of Assay.—Claude E. Hill, of Austin, has made a comparative examination of the different modes of assaying formaldehyde and concludes that of the four methods tried that the cyanide method gives the best results. The objection to the U. S. P. method of assay is that other aldehydes interfere with the correct estimation of formaldehyde and that it cannot be used for solutions of less strength than five per cent., but he says it is very adaptable to strong solutions. The objection to the ammonia method is the volatility of the ammonia, and the iodometric method, like that of the U. S. P., is not of service in the presence of other aldehydes. The cyanide method gives accurate results in the presence of other aldehydes or oxidizing agents; and works equally well in dilute or strong solutions, for in using this method strong solutions are diluted. This process is based on the Vohlard Thio-cyanate method, which is very accurate.—Proc. Texas Pharm. Assoc., 1912, pp. 85-87. (E. C. M.)

Formaldehyde—Examination of Commercial Solutions and Tablets.—In a paper read before the British Pharmaceutical Conference, 1912, C. H. Hampshire and S. Furnival report the results of examination of eleven commercial samples of formaldehyde solution and eighteen samples of tablets, and describe the methods employed for the determination of their constituents. The *specific gravity* at 15.5° C. of the solutions varied from 1.0804 to 1.0886. The *formaldehyde* content, which was determined by the method of Lemme adopted in the G. P., ranged from 35.38 to 37.33 per cent. by weight. The *methyl alcohol* content, as determined by the method of Blank and Finkenheimer, varied from 10.16 to 17.22 per cent. by weight; the *acidity*, calculated as formic acid, varied from 0.043 to 0.085 per cent.; the *ash*, determined by evaporation and subsequent ignition in platinum, was exceedingly small, ranging from 0.0029 to 0.048 per cent., with only traces in two cases, and none at all in two others. The method of the "Codex" for detecting the presence of *acetone* proved unsatisfactory; but by a method of their own device,

which enabled the detection of as little as 0.2 per cent., none of the samples gave indications of more than a trace, and in one case it was entirely absent. Regarding the formaldehyde tablets, the results show that many of the tablets on the market contain much less formaldehyde than is required by the formula of the B. P. Codex.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1912, 465-471.

Formaldehyde—Occurrence in Plants.—According to Baeyer's assimilation hypothesis plants reduce carbon dioxide first to formaldehyde and this then condenses to give carbohydrates. Attempts have been made to prove the occurrence of formaldehyde in plants, but always unsuccessful. Theodor Curtius and Hartwig Franzen have now proved its presence in beech leaves by first driving off the volatile acids, then oxidizing the aldehydes present by means of silver oxide, and proving that formic acid is among the products of the oxidation. Baeyer's hypothesis has thus been confirmed.—Chem. News, Aug. 30, 1912, 108; from Ber. d. D. Chem. Ges., 45 (1912), No. 9.

Formaldehyde—Innocuousness to Insect Life.—On opening some tins in which Hetero and Hottentot heads, preserved in formaldehyde solution, had been imported from German West Africa, P. Schulze observed a large number of flies to escape. Numerous larvæ were also observed swimming in the preserving fluid. These flies and larvæ were identified as *Drosophila rubrostriata*. Fearing that the larvæ would injure the heads, pure 40 per cent. formaldehyde solution was added, but they continued to swim about uninjured. Other instances of great resistance are given, such as that of certain moths of the family *Zygaenidæ*, the "burnets," which are unaffected by prussic acid; the larvæ of the fly, *Musca vomitoria*, placed in 2 per cent. chromic acid solution continuing to live, pupate, and hatch out perfect insects; fly larvæ inhabiting the digestive fluid of the pitcher plant; and the numerous larvæ of *Ephydra alkalina*, in Owen Lake, California, the water of which contains 63.6 Gms. of total solids per litre, including large amounts of potassium and of sodium sulphates, also of sodium carbonate.—Pharm. Journ. and Pharmacist, July 6, 1912, 7; from Zoolog. Anzeiger, 29 (1912), 199.

Phenol Compounds—Systematic Analytical Method.—J. A. Sanchez gives a systematic series of tests which may be applied to detect the presence of the following phenols in a mixture: Pyrocatechin, resorcinol, hydroquinone, pyrogallol, phloroglucin, salicylic acid, gallic acid, tannic acid, and vanillin.

(1) A slate colored or brown precipitate with acid mercuric nitrate shows the presence of *pyrocatechin*.

(2) The solution is precipitated with lead acetate and filtered. If the filtrate gives a pink flocculent precipitate with formol-hydrochloric acid, *resorcinol* is present; or

(3) If it gives an indigo-blue coloration with sulphomolybdic acid, *hydroquinone* is present.

(4) A red coloration when the lead acetate precipitate is treated with formol-hydrochloric acid shows the presence of *pyrogallol*.

(5) Furfural and hydrochloric acid give a green coloration with *phloroglucin*.

(6) If the solution is precipitated with lead nitrate, and hydrochloric acid and ferric chloride are added to the filtrate, a violet coloration shows the presence of *salicylic acid*.

(7) Potassium cyanide gives a ruby red coloration with *gallic acid*.

(8) Nicotine gives a persistent white precipitate with *tannic acid*.

(9) Phloroglucin and hydrochloric acid give a ruby coloration with *vanillin*.—Chem. News, Feb. 9, 1912, 71; from Bull. Soc. Chim. de France, ix-x, No. 24.

Phenol Glycocol Esters—Characters.—Mannich and Drauzburg present a study of combinations of phenol esters of acetic acids. The ones prepared were:

(1) *Chloracetic acid phenol ester* $\text{CH}_2\text{ClCOOC}_6\text{H}_5$, from phenol and chloracetyl chloride, white needles m. p. 45° ; b. p. 123° - 126° at 14 Mm.

(2) *Iodoacetic acid phenol ester* $\text{CH}_2\text{IOOC}_6\text{H}_5$, white prisms m. p. 68° , from acetone solutions of chloracetic phenyl ester and sodium iodide.

(3) *Hexamethylene tetramine*, compound of "2" $\text{C}_6\text{H}_5\text{OCOCH}_2\text{N}_4(\text{CH}_2)_6$.

(4) *Amino-acetic acid phenyl ester hydrochlorate*, $\text{C}_6\text{H}_5\text{OCOCH}_2\text{NH}_2\text{HCl}$, made by treatment of "3" with absolute alcohol and 38% HCl. Fine scales, m. p. 206° - 208° .

(5) *Chloracetic acid guaiacol ester* $\text{C}_6\text{H}_4(\text{OCH}_3)\text{OCOCH}_2\text{Cl}$, made like "1," m. p., 58° - 59° .

(6) *Bromacetic acid guaiacol ester* $\text{C}_6\text{H}_4(\text{OCH}_3)\text{OCOCH}_2\text{Br}$ from guaiacol and brom-acetyl bromide. White needles, m. p., 45° , b. p., 181° at 25 Mm.

(7) *Iodo-acetic acid guaiacol ester* $\text{C}_6\text{H}_4(\text{OCH}_3)\text{OCOCH}_2\text{I}$ by treatment of "5" with 15% NaI in acetone. White needles, m. p., 36° .

(8) *Iodo-acetic acid guaiacol ester and hexamethylene tetramine* $C_6H_4(OCH_3)OCOCH_2N_4(CH_2)_6I$, white scales, m. p., 157° - 158° , with some decomposition.

(9) *Amino-acetic acid guaiacol ester hydrochlorate* $C_6H_4(OCH_3)COCH_2NH_2HCl$, made by treatment of "8" with absolute alcohol and 38% HCl. White crystals, m. p. 196° .

(10) *Chloracetic acid ester of eugenol* $C_6H_3(CH_2CH=CH_2)(OCH_3)(OCOCH_2Cl)$ 1.3.4., from eugenol and chloracetyl chloride. White crystals m. p. 23° , b. p. 187° - 193° at 13 Mm.

(11) *Chloracetic acid ester of o-nitro-phenol* $C_6H_4(NO_2)OCOCH_2Cl$ from o-nitrophenol and a chloracetyl chloride. White needles, m. p., 63° .

The object of this line of investigation was the finding of suitable water soluble non-irritating phenol and guaiacol derivatives.—Arch. d. Pharm., 250 (1912), No. 7, 532. (H. V. A.)

Phenol—Rapid and Accurate Methods for Determining.—L. V. Redman and E. O. Rhodes have made a study of the bromide-bromate and the hypobromite methods for the determination of phenol, endeavoring to shorten the time required for the assay and comparing the hypobromite method with the bromide-bromate method for accuracy, ease of manipulation, and time required for the determination.

As a result of their work they state that both methods are capable of reaching an accuracy of only 0.3 per cent. error, and that the reaction period may be reduced from 30 minutes to 1 minute of continuous shaking, after adding the bromine, without sacrificing accuracy.

However, it is necessary to shake for at least 3 minutes after adding the KI solution, otherwise an error of 0.5 per cent., due to this cause alone, will occur.

The bromide-bromate solution was found to be much more stable than the hypobromite solution, and is also free from the odor of bromine.—Journ. Ind. and Eng. Chem., Sept., 1912, Vol. 4, p. 655. (L. A. B.)

Phenol—Gangrene Caused by Its Application.—Buckmaster, F., reports a case of gangrene of the anterior surface of the right leg, just below the knee, caused by the application of phenolized petrolatum.—J. Am. M. Assoc., 1912, v. 58, pp. 102-103. (M. I. W.)

Calcium Phenolsulphonate—Nature of Commerical.—Puckner, W. A., reports that, although calcium phenolsulphonate is a distinct chemical substance and is sold by several manufacturers of chemi-

cals, examination showed that the several brands differed considerably in composition and were unsatisfactory as to purity.—J. Am. M. Assoc., 1912, v. 59, p. 1157. (M. I. W.)

Cresols—Volumetric Determination.—C. P. Peace mentions that ortho- and para-cresol readily form diiodo compounds when treated with solution of iodine in presence of sodium acetate, and the reaction being quantitative, it can be used for the volumetric determination of these cresols. Meta-cresol, however, does not form diiodo compounds under these conditions, but may be determined with bromine as tribrom-meta-cresol.—Journ. Ind. and Eng. Chem., 1912, 518.

Creosote—Determination in Tablets.—Charles E. Vanderkleed and Fritz Heidelberg suggest the following as satisfactory methods for the determination of the creosote content of tablets:

For plain tablets an amount containing forty to fifty grains of creosote is finely powdered and heated with about 50 Cc. of water and 10 Cc. strong NaOH solution (1:2) for about one hour on a water bath. In this time the creosote will have dissolved in the alkaline liquid. (For tablets in which the creosote is present in combination with magnesium a longer digestion is necessary and it is more convenient to shake the powdered tablet for several hours with the NaOH solution.)

The liquid is now transferred into an eight-ounce milk centrifuge bottle, cooled, 50 Cc. of benzene added and then enough strong HCl is added slowly to render the liquid acid. The bottle is corked and shaken vigorously for ten minutes and then centrifuged. The upper benzene layer is carefully poured off into a separator, and the shaking with benzene is repeated two or three times, until the last benzene layer is nearly colorless. In case the combined benzene solutions do not amount to more than 70 Cc. they can be poured directly into the measuring flask. In case they do amount to more, it is necessary to either concentrate them or to work them up in two portions. The best plan, however, is to concentrate either by distilling off some of the benzene, in which case it is necessary to add some strong NaOH solution in order to avoid loss of creosote, or to shake the separator with successive portions of 20, 10 and 10 Cc. of strong NaOH solution (1:3), adding 50 Cc. of benzene, preferably the one which contained the creosote before, and neutralizing the combined NaOH solution by slowly adding strong H_2SO_4 (60%), using methyl-orange as indicator. Shake the separator and let separate completely. Draw off the watery solution which is re-

jected. In the meantime, place about 20 Cc. of strong NaOH solution (1:3) in the measuring apparatus described in Bulletin No. 107, Bureau of Animal Industry, P. 16; with the aid of pipette add 1 Cc. of benzene, and take the reading of the NaOH solution carefully. Now pour the creosote solution into the measuring apparatus, through a funnel fitted with cotton moistened with benzene. Rinse out the separator with successive small portions of benzene, and shake the measuring bulb vigorously for five minutes. Let stand for about two hours, rotating occasionally to hasten the separation. In case a slight emulsion occurs, heat gently over water-bath to break the same. After the meniscus is perfectly sharp take the reading and calculate the amount of creosote by multiplying the number of Cc. of increase in the NaOH solution by the specific gravity (108). In determining guaiacol the same method can be used with the difference that the number of Cc. has to be multiplied by the sp. gr. of guaiacol.

For gelatine-coated tablets it is better to avoid heating on account of the gelatine of the coating. The powdered tablets are merely shaken with about 50 Cc. of NaOH T. S. for several hours, then acidified and treated in the same way as the plain tablets.—Proc. Penn. Pharm. Assoc., 1912, pp. 301-303. (E. C. M.)

Guaiacol-ferric Acid—Formation and Compounds.—R. F. Weinland and K. Binder find that when an organic ferric salt soluble in alcohol, for example, ferric acetate, is brought in contact with an alcoholic solution of guaiacol and alcoholic ammonia, a definite crystalline compound, "tetra guaiacol-ferric acid" is formed, to which he assigns the formula $[\text{Fe}(\text{O}.\text{C}_6\text{H}_4.\text{OCH}_3)_4]\text{H}$. This combines with the ammonia, forming $[\text{Fe}(\text{O}.\text{C}_6\text{H}_4.\text{OCH}_3)_4]\text{HN}_4$, as a micro-crystalline, insoluble powder, consisting of minute prisms. The analogous sodium salt crystallizes in transparent four- or six-sided leaflets, and the potassium salt in quadratic prisms.—Pharm. Journ. and Pharmacist, Nov. 9, 1912, 581; from *Berichte*, 45 (1912), 2498.

Resorcinol—Fine Powder Form.—The crystallized resorcinol is difficult to reduce to a very fine powder to be used in ointments and especially in dusting powders. Several German manufacturers are now marketing a *Resorcinum sublimatum purissimum subtilissime pulveratum* for this very purpose, which can also be obtained in the United States.—Apoth. Ztg., 1912, No. 44, 405. (O. R.)

Glycerin—Inadequacy of Some G. P. U. Tests of Purity.—Supplementing some previous criticisms on the G. P. v. tests for glycerin, O. Heller directs attention to the inadequacy of the test for the presence of iron salts, which demands that no immediate blue color should appear when solution of potassium ferrocyanide is added to a slightly acidulated aqueous dilution of glycerin made in the proportion of 1:5. He finds that in most glycerins a faint bluish tint manifests itself under the conditions of this test. Another uncertain test is that prescribed for detecting the presence of arsenic in glycerin. The G. P. requires that a mixture of 1 Cc. of glycerin and 3 Cc. of stannous chloride shall not acquire a "darker" coloration within one hour. The author finds, however, that while in pure glycerins no "darker" coloration is produced, in many cases a yellowish coloration is developed, which might be interpreted as evidence of the presence of arsenic compounds, notwithstanding that the same yellowing is produced on the addition of pure hydrochloric acid to pure glycerin.—Pharm. Ztg., lvii (1912), No. 72, 727; from *Der Seifenfabr.*, 1912, No. 33.

Glycerin—Determination in Suppositories.—Charles E. Vanderkleed and Fritz Heidlberg recommend the following method, based upon Hehner's bichromate method for the determination of glycerin in suppositories: About half of the suppository (about 2 Gm.) is dissolved in a separator with hot water acidified with sulphuric acid and shaken out with ether whereby a separation from the stearic acid is effected. The watery solution is evaporated on a steam-bath to a small volume, 10 Cc. water are added and again evaporated to a small volume, thereby effecting a complete separation of the ether. The solution is rinsed into a 250 Cc. volumetric flask, cooled, and filled to the mark with water. (In case a preliminary test showed the presence of chloride, it is better, after evaporation, to add a little freshly precipitated silver carbonate, from 0.1 Gm. of silver sulphate. Let stand for ten minutes and fill up to the mark. Twenty-five Cc. of the filtered solution are measured from a pipette into a 250 Cc. volumetric flask, 35 Cc. of potassium bichromate solution are added, and lastly 25 Cc. of strong sulphuric acid are added slowly under constant rotating to avoid ebullition. The flask is then transferred to a boiling water-bath for 20 minutes, cooled, and filled to the mark. In 25 Cc. of this solution the excess of bichromate is determined by adding 20 Cc. of potassium iodide T. S. and titrating against approximately $N/10 \text{ Na}_2\text{S}_2\text{O}_3$, the factor of which toward the potassium bichromate solution has been determined previously. Calculate the amount of potassium bichromate which has been used to oxi-

dize the glycerin to carbon dioxide. One Cc. of potassium bichromate is equivalent to 0.01 Gm. of glycerin. The potassium bichromate solution is prepared by dissolving 74.615 Gm. re-crystallized potassium bichromate in water, adding 150 Cc. sulphuric acid, and diluting with water to 1000 Cc. at 20° C. In order to determine the factor of the sodium thiosulphate toward the potassium bichromate solution it is advantageous to dilute 10 Cc. of the latter to 100 Cc. and to use 10 Cc. of this dilution for the titration.—Proc. Penn. Phar. Assoc., 1912, pp. 307-308. (E. C. M.)

Glycerin—Determination in Tooth Paste, etc.—Charles E. Vanderkleed and Fritz Heidelberg recommend the following method for the determination of glycerin in toothpaste: An amount of the mixture containing about 2 grammes of glycerin was shaken in a centrifuge bottle with 30 Cc. of a mixture of 2 parts of absolute alcohol and one part of absolute ether. After all the glycerin had dissolved in this mixture the bottle was centrifuged and the clear solution, containing glycerin, and phenol soap and essential oils together with traces of chlorides was filtered through paper into a beaker. The extraction with the alcohol-ether mixture was repeated twice and the united solutions and washings were evaporated at a low temperature to a small volume. 20 Cc. of water were added to it and the digestion continued on the water-bath. When the volume had reached about 10 Cc. the contents were transferred to a separator, the beaker rinsed repeatedly with water and the glycerin solution, after acidifying with dilute H_2SO_4 , was shaken with about 20 Cc. of ether, in this way separating the glycerin from the phenol, soap, and oils. The watery solution was drawn off, the ether washed twice, and the solution and washings evaporated and treated in the same way as the glycerin solution of the process for the determination of glycerin in suppositories before quoted.—Proc. Penn. Phar. Assoc., 1912, p. 308. (E. C. M.)

Glycerin—Action of Ultra-Violet Rays Upon it.—V. Henri and A. Ranc find that under the influence of a powerful mercury-quartz lamp the molecule of glycerol is very rapidly broken down with the formation of formaldehyde, and traces of other aldehydic substances. In presence of hydrogen peroxide this action is markedly accentuated, and in proportion to the amount of peroxide present.—Pharm. Journ. and Pharmacist, July 6, 1912, 7; from Compt. rend., 154 (1912), 1261.

Nitroglycerin—Poisoning by Absorption.—Evans, E. S., reports a case of nitroglycerin poisoning from absorption of nitroglycerin through the skin of the hands.—J. Am. M. Assoc., 1912, v. 58, p. 550. (M. I. W.)

Glycerophosphoric Acid and Salts—General Review.—In the Annual Report of E. Merck for 1912 a general review of the present status of glycerophosphoric acid and its salts is given which, coming from one of the most renowned manufacturing firms, gives concise information concerning these products, not generally available in the literature. Historically it is mentioned that among the possible glycerides of phosphoric acid, the phosphoric acid monoglyceride — $\text{CH}_2\text{OH}.\text{CHOH}.\text{CH}_2\text{O}.\text{PO}(\text{OH})_2$ — is the only one of importance. This compound, tersely named

Glycerophosphoric Acid was discovered by Pelouze in 1846, but did not attract special attention until in recent years it was shown, particularly by Robin, that its compounds exert an elective effect upon nerve-nutrition, this giving the incentive to the introduction of its salts as nerve-tonics in the practice of medicine. Pure glycerophosphoric acid of 100 per cent. cannot be prepared, because its aqueous solution suffer decomposition during concentration, but 25 and 50 per cent. solutions are commercially available—these being colorless fluids which are partially decomposed on evaporation. Glycerophosphoric acid is bibasic and therefore capable of forming acid and neutral salts, the most important being the calcium salts.

Neutral Calcium Glycerophosphate, also known as "Neurosin," forms a white crystalline powder, soluble in water at the ordinary temperature in the proportion 1:40. It has an alkaline reaction on litmus paper, and when its solution is heated this becomes turbid owing to the separation of a portion of the salt as such.

Acid Calcium Glycerophosphate is distinguished by its great solubility; but owing to its extreme hygroscopicity it can only be supplied in form of a 50 per cent. solution.

Neutral Sodium Glycerophosphate is the salt next in importance. It forms white, readily soluble crystals, representing 70 per cent. of anhydrous $\text{Na}_2\text{PO}_4\text{C}_3\text{H}_7\text{O}_2$.

Acid Sodium Glycerophosphate ($\text{NaHPO}_4\text{C}_3\text{H}_7\text{O}_2$) has not yet been obtained in solid form because the acid glycerophosphates in general, or when in solution of certain concentration, are decomposed on continuing heating and evaporation. Of the other glycer-

phosphate, such as iron, ammonium, bismuth, quinine, potassium, lithium, magnesium, manganese, strontium, strychnine, and zinc,

Ferric Glycerophosphate, representing 14-15 per cent. Fe, is the only one of importance. An excellent

Tonic Wine is obtained by triturating 10 Gm. of this salt with 40 or 50 Gm. of glycerin, adding 1000 Gm. of Spanish wine and, after macerating four hours with occasional agitation, filtering.

Tonic Wine of Calcium Glycerophosphate is obtained by mixing 10 Gm. of neutral calcium glycerophosphate with 750 Gm. of Sherry wine, adding 3 Gm. of tartaric acid and when solution is effected 250 Gm. more of Sherry wine.

Syrup of Calcium Glycerophosphate, possesses stability with an agreeable taste. May be made either with the neutral or acid salt, by dissolving 10 Gm. in 900 Gm. of simple syrup, and flavoring this by the addition of 100 Gm. of syrup of orange peel or of syrup of orange flowers.—Pharm. Ztg., lvii (1912), No. 41, 410-411.

Calcium Glycerophosphate—Poor Quality of.—Puckner, W. A., comments on the quality of calcium glycerophosphate as marketed in this country, and, in reporting the examination of five samples of the article, points out that none of the specimens examined complied with the generally accepted requirements for solubility in water, and that those which were most nearly soluble were such as contained considerable quantities of an organic acid. Four of the samples contained sulphate. One specimen contained both chloride and sulphate. In other words, all of the specimens were decidedly impure in one or more particulars. While the manufacturers have in general acknowledged the poor quality of their product, they have shown considerable indifference concerning its improvement.—J. Am. M. Assoc., 1912, v. 59, pp. 134-135. (M. I. W.)

FIXED OILS AND FATS.

Fats—New Method of Determining the Acetylatable Constituents.—W. Norman suggests a new factor for the analytical valuation of fats to which he proposes to give the name "hydroxyl value." About 2 Gm. of the fat, accurately weighed, is boiled with 4 to 6 Cc. of acetic anhydride under a reflex condenser for half to one hour. The flask is then fitted with an inlet and outlet tube, the former dipping beneath the acetylated liquid; the flask is immersed up to the neck in a boiling water-bath, and a strong current of carbon dioxide, coal gas, or in the case of nonoxidizable fats, air, is aspirated through the liquid until all free acetic anhydride is removed,

this requiring about thirty minutes. The content of the flask is diluted with a little ether, a small quantity of water is added, and just sufficient aqueous alkali to neutralize the trace of free acid present. Then 50 Cc. of N/2 alcoholic KOH is run in and saponification conducted in the usual way, titrating back with N 2 hydrochloric acid. The value found, less the saponification value of the original fat, previously ascertained, gives the "hydroxyl value" of the fat.—Pharm. Journ. and Pharmacist, Oct. 5, 1912, 421; from Chem. Rev. Fett. Harz., 19 (1912), 205.

Fats and Oils—Comparison of Hübl's and Wijs's Methods for Determining Iodine Number.—The many criticisms regarding Hübl's method for determining the iodine number of fatty substances, which is the French official method, have prompted M. Auquet to make a comparative study of this method and that of Wijs's, from which he draws the following conclusions: (1) The use of Hübl's solution acidified to the extent of 3.50 Gm. of hydriodic acid per liter ensures exact results, whatever the age of the solution. (2) The difference between the Wijs number and the Hübl number determined by means of an acidulated solution is very small, and does not exceed 1 per cent. in the majority of fats and oils. (3) The influence of temperature on the index in both cases is negligible between 10° and 25°. (4) A contact of one hour suffices for the determination of the Hübl number in most fatty substances. (5) Wijs's method is more rapid and less costly than that of Hübl.—Pharm. Journ. and Pharmacist, Nov. 16, 1912, 613; from Ann. de Falsific., October, 1912, 459.

Fixed Oils and Fats—Improved Method of Determining the Iodine Number.—G. O. Gaebel has used with advantage the potassium bromide-bromate solution, directed in the G. P. v. for phenol-determination, for the determination of the iodine number in fats and oils. The bromatic solution is prepared by dissolving 1/60 mol. of potassium bromate and 5/60 mol. of potassium bromide in sufficient water to make 1 liter, and the determination of the iodine number is carried out with this as follows:

The usual quantity of fat or oil is weighed into a glass stoppered flask of about 400 Cc. and dissolved in 10 Cc. of carbon tetrachloride; 50 Cc. of the bromide-bromate solution are added, mixed by rotating the flask, and the mixture is strongly acidulated with 30 Cc. of diluted sulphuric acid (1:5). The flask is then securely closed with the slightly paraffined glass stopper, vigorously shaken once or twice, and then set aside at the room temperature protected

from light. After permitting time for the complete reaction, the absorbed bromine is determined by carefully raising the stopper, adding about 1 Gm. potassium iodide dissolved in a little water, then shaking vigorously and, after a few minutes, adding about 50 Cc. of water, using this for rinsing the stopper and upper part of the neck of the flask. Finally the iodine liberated by the excess of bromate used is titrated in the usual manner with 1/10 N thiosulphate, using starch parts as indicator. A blank experiment is made with 50 Cc. of the bromide-bromate solution, and from the data so obtained the iodine number is readily ascertained by calculation ($1 \text{ Cc. Na}_2 \text{ 1/10 N, Na}_2\text{S}_2\text{O}_3=1 \text{ Cc. 1/10 N—Br.}=1 \text{ Cc. 1/10 N—J}=0.012692 \text{ Gm. iodine}$). The results correspond quite accurately with the Hübl number given in the G. P. v.—Arch. d. Pharm. 250, (1912), No. 1.

Volumetric Assay of Unsaturated Organic Compounds.—Gaebel discusses the history of the volumetric solution of potassium bromide and potassium bromate (Koppeschaar's Solution) and its use for the assay of phenol and its employment in other assays where it is used because of the behavior of the liberated bromine, as oxidizer, in substitution processes or in addition reactions, when a "bromine number" similar to the Hübl iodine number is obtained. After reciting the work of Mossler, MacIlhiney, Niemann and Klimont, in this direction, he reports his own work toward establishing a bromination assay of fats, to replace the expensive and time-consuming Hübl assay. He obtained, however, accurate results only with oil of theobroma, suet, lard and olive oil. Endeavoring to find reason for discrepancies encountered he next studied the behavior of Koppeschaar's Solution with the unsaturated acids and obtained quantitative results with crotonic and cinnamic acids, but irregular figures with oleic, sorbinic, maleinic, fumaric and phenylpropionic acids.—Arch. d. Pharm., 250 (1912), Nos. 1 and 2, 72 and 81. (H. V. A.)

"Hardened" Oils—Production and Characters.—Dr. Aufrecht gives some interesting information concerning the physical and chemical properties of "hardened" oils, about which little has appeared in the literature. These products, which promise to become of importance in the soap and food industry, and have also attracted some attention in the manufacture of pharmaceuticals and cosmetics, are obtained under patented processes, depending on the action of hydrogen upon different oils, such as rape, sesame, arachis, cotton, ricinus, and train oils, in the presence of a catalyzor, such as nickel, colloidal palladium, or palladium chloride, or in the absence

of catalyzors, by passing a continuous current of hydrogen and oil through a perforated centrifuging drum. Under these treatments, aided in some cases by heat (150° - 180°), in others conducted at the ordinary temperature, the unsaturated acids of the oils (animal or vegetable) are converted into saturated fatty acids, in accordance with the equation $C_{18}H_{34}O_2 + 2H = C_{18}H_{36}O_2$, and present in general the following characters: They possess great hardness, have a granular structure, and, according to the particular method, are either yellowish or pure white. They have no marked odor, but when heated to melting manifest a peculiar pyrogenous odor. The taste is unpleasant, reminding of rancid tallow. They are readily soluble at the ordinary temperature in ether, chloroform, carbon tetrachloride, benzin, petroleum, and carbon disulphide, but only sparingly soluble in alcohol and methyl alcohol. The specific gravity ranges from 0.9252—0.9268 at 15° C., and the melting point from 44.5° to 46.5° C.; in fact there is a close agreement in the constants of the "hardened" oils (also known as "Duotol") obtained from different sources, as shown in a table giving the results obtained by the author with yellow and white "duotol" and with "hardened train oil."—*Pharm. Ztg.*, lvii (1912), No. 87, 876-877.

China Wood Oil—A Method for Examining.—Parker C. McIlhiney states that when China wood oil is dissolved in 99½ per cent. acetic acid, and a solution of iodine in 99½ per cent. acetic acid is added to it, there is an immediate separation of some solid product. If a petroleum distillate (b. p. below 80° C.) be now added and mixed thoroughly, decanted and the extraction repeated with a second and third portion of solvent and decanted, and the mixed liquids treated in a separatory funnel with water until free from acetic acid, then extracted with a solution of potassium iodide, until the petroleum solvent is free from free iodine, the petroleum solvent evaporated and the residue weighed, the weight of the residue represents fairly accurately the proportion of foreign oils present in the sample.—*Journ. Ind. and Eng. Chem.*, July, 1912, Vol. 4, p. 496. (L. A. B.)

Chinese Wood Oil—Constants.—A. Kreikenbaum finds the following:

Sp. gr.....	0.941
Iodine number.....	170.4
Acid number.....	1.7 to 7.1
Saponification number.....	190.9

—*Ph. Zhalle*, 1912, No. 11, 296; from *Chem. Ztg.* xxxiv, Rep. 266. (O. R.)

China Wood Oil—Refractive Index.—Louis E. Wise points out that China Wood Oil possesses a refractive index higher than that of any other drying oil and submits a table showing the refractive index of a number of *commercial* wood oils. The author states that owing to the primitive conditions in the collection and the shipment of the oil to the coast from the country districts of China, he was unable to get authentic samples. The index of refraction at 25° C. of the oil ranges from 1.5099 to 1.5186, while that of linseed oil is 1.4810, soya bean oil is 1.4751 and tallow oil is 1.4833; thus gross adulteration of China wood oil can be very readily shown by the use of the refractometer.—Journ. Ind. and Eng. Chem., July, 1912, Vol. 4, p. 498. (L. A. B.)

Cottonseed Oil—Improvement of Halphen's Test—E. Gastaldi attributes the coloration obtained by Halphen's reaction on cottonseed oil to the impurities in amyl alcohol. Pyridine quinoline, aniline, potassium and sodium hydroxides, and ammonia all produce the same coloration (with cottonseed oil), and the author therefor suggests an improved form of the test, which is as follows: To 5 Cc. of the oil, one drop of pyridine is added, followed by 4 Cc. of carbon disulphide containing 1 per cent. of sulphur in solution, and the mixture is warmed for half an hour on the water-bath. By this method, 0.25 per cent. of cottonseed oil may be detected with certainty.—Pharm. Journ. and Pharmacist, Nov. 2, 1912, 553; from Giorn. Farm. Chim., 61 (1912), 289, through Journ. Soc. Chem. Ind.

Olive Oil—Detection of Peanut Oil.—According to Dr. L. Adler the presence of 5 per cent. or more of peanut oil in olive oil may be detected by saponifying 1 Cc. of the suspected oil with 5 Cc. of 8 per cent. alcoholic potash solution in a 100 Cc. Erlessmeyer flask on a boiling water bath, for four minutes, with frequent shaking; then cooling to 25°, adding accurately 1.5 Cc. of a diluted acetic acid (1 vol. glacial acid, 2 vol. water) and 50 Cc. of 70 per cent. (vol.) alcohol, shaking well, heating, if necessary, to remove any turbidity, and then carefully cooling by immersion in cold water and with shaking until the temperature is reduced to exactly 16° C. If no turbidity occurs after occasional shaking within 5 minutes, the temperature is further reduced to 15.5° C., and if then, after waiting another 5 minutes, no turbidity results, the sample contains less than 5 per cent, or no peanut oil at all.—Pharm. Ztg., lvii (1912), No. 55, 555; from Ztschr. f. Unters. d. Nahr.-u. Genussm. (1912), No. 12.

Tiger's Fat—Chemical and Physical Constants.—David Hooper mentions that the fat of the tiger (*Felis tigris*) has a considerable local reputation as a healing remedy for ulcers and skin affections. A specimen received from Mourbhanj, somewhat decomposed, gave the following constants: Sp. gr. at 40° C., 0.8912; m. p., 35° C.; acid val., 133; sapon. val., 200.8; iodine val., 57.7; contained 95 per cent. fatty acids melting at 37.5°, consisting principally of oleic and palmitic acids; neutralization value, 208.2.—Pharm. Journ. and Pharmacist, Oct. 26, 1912, 519; from paper read before the Asiatic Society of Bengal, Aug. 7, 1912.

Turkey Red Oil—Complex Composition.—The product obtained by the action of strong sulphuric acid on castor oil, at 30°-40° C., is known as Turkey red oil. This, when washed with a solution of sodium sulphate or chloride, and neutralized, is usually regarded as the sodium or ammonium salt of sulphoricinoleic acid, and forms either a permanent emulsion or a solution when added to water. F. W. Richardson and W. K. Walton, however, find on analysis that this product consists of sodium salt of ricinoleic sodium sulphate, 14.73; monoglyceride, 4.40; ricino-ricinoleic acid, 3.33; ricinoleic acid, 8.91; sodium ricinoleate, 10.47; diricinolein, 4.21; triricinolein, 1.05; phytosterol, 0.17; glycerin, 0.82; sodium sulphate, 0.24; sodium chloride, 0.16; water, 50.90.—Pharm. Journ. and Pharmacist, Aug. 17, 1912, 233; from Journ. Soc. Chem. Ind., xxxi, 3, 105.

CARBOHYDRATES.

Cellophan—A New Cellulose Product for Impervious Paper.—In "Les Nouv. Remèdes" (No. 15, 1912), a new cellulose product is described under the name of "cellophan," which is prepared in the bleachery at Thaon-Vosges by dissolving cellulose, reprecipitating it, and then subjecting the precipitate to treatment similar to that employed in paper-making, by which it is obtained in form of transparent and very stable sheets of 14/100 Mm. thickness and upward. These sheets are odorless and tasteless, swell up when immersed in water, and burn like ordinary paper without exploding. It is not affected by alcohol, ether, chloroform, iodine, or volatile and fixed oils, but is attacked somewhat by alkalies. It is superior to parchment paper as a filtering medium for bacteria and as a dialyzing membrane. By boiling water, hydrogen dioxide, and corrosive sublimate it may be sterilized, and thus becomes useful as a substitute for the more expensive materials usually employed for the protection of surgical appliances, bandages, as well as a protective

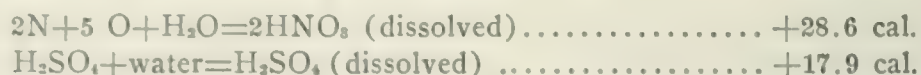
wrapper for a variety of medicines, food products, etc., economically replacing gauze, caoutchouc, parchment paper, and tinfoil usually employed for one or the other of these purposes. The new material may be colored, pressed into any desirable shape, and readily receives imprints.—Pharm. Ztg., lvii (1912), No. 75, 758.

Formylated Cellulose—Experimental Efforts for its Industrial Production in Competition with Nitrocellulose.—At a meeting (November 4, 1912) of the London Section of the Society of Chemical Industry, Edward C. Worden spoke interestingly of the serious attention given by chemists to formylated cellulose in the search for esters which, while at the same time unflammable and non-explosive, could still be produced at a figure admitting of direct competition with nitrocellulose. The fact that in the formylation of cellulose no counterpart of acetic anhydride—the most expensive constituent of the acetylating mixture—is required is, in the author's opinion, the principal factor for the great activity displayed in this field at present. It appears quite probable that in the near future the cellulose formates may be produced in unlimited amounts commercially, at a cost at least not higher than the present cost of nitrocellulose, starting with the same source of cellulose. His own attempts at obtaining flexible coherent films of formulated cellulose have so far, however, not been successful.—Pharm. Journ. and Pharmacist, Nov. 9, 1912, 589.

Laminated Artificial Silk.—Dr. A. Verda discusses transparent cellulose which has recently come into the European market under such trade names as *gaudafil*, *aseptafil* and *cellamine*. It comes in thin sheets, impervious to water, oil and air but permits passage of steam. It can be used as a wrapping instead of parchment, as protective covering for wounds in place of taffeta or sheet gutta percha (since it can be sterilized) and as a dialyzing membrane.—Schweiz. Wschr. f. Chem. u. Pharm., 1 (1912), No. 20, 301. (H. V. A.)

Nitrocellulose (Fulmicotton)—New Method of Preparation.—A. Dufay describes a new method of preparing nitrocellulose which depends on the use of a mixture of nitric anhydride and monohydrated nitric acid, or a mixture of $16.5 \text{ N}_2\text{O}_5$ and sufficient HNO_3 to immerse the mass of cotton in it. The object of this method of preparation is to avoid the use of monohydrated sulphuric acid in the manufacture of nitrocellulose, and to replace it by a known quantity of nitric anhydride, corresponding to the formula of the "fulmi-

cotton" which is to be obtained. The reason for this substitution is explained by the following equations:



Since the reaction takes place in a nitric medium there is no fear of secondary reactions; and as the weight of cotton in the dry state and the exact degree of acidity of the bath are known the reaction can be followed. The dry cotton is weighed before and after nitration; the acid bath is titrated before and after the immersion, the second titration being referred to the final volume or weight, and the final washing is performed in a known quantity of distilled water, so that the total amount of acid can be determined. The nitric anhydride is prepared by the method of Weber, perfected by Berthelot, by distilling a mixture of fuming nitric acid and phosphoric anhydride, the author finding that the process can be carried out on a commercial scale in a retort of enameled iron which he describes, and the freezing machine required, as well as a sufficiently large apparatus to make the phosphoric anhydride, may be made of the same material. It is an advantage also that in this process the same acid bath may be used by replenishing it after each soaking with sufficient N_2O_5 , calculated from that consumed, and of HNO_3 to completely cover the cotton.—Chem. News Nov. 1 1912, 211.

Starch Granules—"Zahlkammer," a Device for Their Identification in Drug Examinations.—Hartwich and Wichmann describe the difficulty in securing by microscopic means accurate results when estimating the amount of an adulterant in a powder mixture. To secure the needed accuracy they have devised a microscopic ruled slide that is a modification of the blood count slide. Their slide has etched upon it 100 squares, each of 1.5 square millimeters area. The squares are enclosed in a chamber, the walls of which are strips of cover glass 0.25 Mm. thick. Into this chamber the powder (or usually its dilution with pure sugar, 1 to 100 or 1 to 1000) is placed, carefully weighed, and then a definite quantity of water (3 to 4 drops) is added and a cover glass placed over the chamber and the powder examined. On addition of the water, the sugar dissolves, leaving the powder sometimes in very minute quantities, distributed over the slide, and a counting of the characteristic plant elements in three or four of the 1.5 square millimeter spaces usually furnishes a safe average.

A typical report is one on the percentage of clove stalks in a sample of powdered cloves. The stalks contain characteristic stone cells and from their number, the percentage of adulteration was de-

ducted by the following reasoning: 0.01 Gm. of a 1 per cent. triturate of clove stalks (0.0001 Gm. of the stalks themselves) was put into the slide and on counting in three different experiments, 173, 166 and 156 stone cells were found. That is, there was an average of 165 stone cells to each 0.0001 Gm. clove stalks or one stone cell to each 0.00000061 Gm. clove stalk powder. Taking as "unknown" a sample of powdered cloves, that had been admixed with clove stalks, the observer calculated by count of the stone cells that the powder contained 15.65 per cent. stalks. In truth, 15 per cent. had been added.

The adulteration of saffron with sandal wood could likewise be proven by the wood particles, but this was more difficult, since the woods cells are not of a uniform size. The average, however, was one wood cell to 0.000000028 Gm. of powdered sandal wood.

Discussing starch granules, it is shown that the moisture of the different starches varies from 11.68 per cent. in wheat starch to 15.53 per cent in canna starch.

From count of the several air-dried starches, was deduced the following weight of their granules:

Rice starch.....	0.00000000018 Gm.
Corn starch.....	0.00000000082 Gm.
Arrowroot starch.....	0.00000000073 Gm.
Wheat starch.....	0.00000000069 Gm.
Canna starch.....	0.0000000036 Gm.
Potato starch.....	0.00000000076 Gm.

The rest of the paper is given to discussing the relationship of size and weight of the granules and the verification of data so obtained by calculation of the density of the granules. The writers confirm Flukiger's statement of the marked difference in density if the granules are air-dried or dried at 100°, and also the interesting fact that while air-dried potato starch is lighter than arrow-root starch, when both are dried at 100° the potato starch is much heavier.—Arch. d. Pharm., 250 (1912), No. 6, 452. (H. V. A.)

Starch—Chemical Effect of X-Rays.—When starch solutions are irradiated for several hours their opacity and viscosity are markedly reduced and about 5 per cent. of the starch is converted into soluble starch and dextrin.—Sc. Am., 1912, Vol. 107, 3. (O. R.)

Starch—Action of Light Upon its Aqueous Solution.—According to the observations of J. Bielecki and R. Wurmser, starch in aqueous solution is entirely decomposed when exposed to ultra-violet rays. Among the products of decomposition and oxidation identified are dextrans, reducing sugars, pentoses, formaldehyde, and acid sub-

stances. The results throw an important light on the biological importance of light for the disintegration of carbohydrates during the life of the plant.—Pharm. Journ. and Pharmacist, Nov. 9, 1912, 581; from Compt. rend. 154 (1912), 1429.

Soluble Starch—A New Form Obtained by the Action of Acetone.—A. Fernbach has studied the effects of various dehydrating agents on starch as a means of converting it into the soluble form, and finds that this can be done by means of pure acetone. A one or two per cent. of suspension of commercial potato starch is poured into a large excess of pure acetone and shaken vigorously; a flocculent precipitate is thus obtained, which, when collected on a Buchner funnel, transferred to a mortar, triturated with acetone, and dried *in vacuo*, is a perfectly white mass, pulverulent and very light, and soluble not only in hot water but in cold water; 1 Gm. dissolves easily in 100 Cc. of cold water, leaving only an infinitesimally small insoluble residue. This soluble starch has almost no reducing power. It is easily saccharified by malt extract. Its solution filters readily through paper, and is colored an intense blue by iodine. If in making the soluble starch more than 2 per cent. of the original starch is used, a product is obtained which is only partially soluble in the cold, but the insoluble portion can be separated by filtration through paper.—Pharm. Journ. and Pharmacist, Dec. 7, 1912, 711; from Compt. rend., Sept. 30, 1912, 617.

Mucilages—A Comparative Study of Various Kinds.—W. Schirmer publishes portions of his inaugural dissertation on the composition of the following mucilaginous materials which have hitherto been but little studied.

1. *The Gum of Anogeissus latifolius*, the exudation of a tree of the Combretaceae family growing in India is in some demand in calico printing. This gum contains 15.82 per cent. moisture, is partly soluble in water (a table of solubility in alcohol and in acetic acid is given) yields 3.03 per cent. ash consisting of 29.46 per cent. calcium, 8.43 per cent. magnesium, traces of potassium, iron and chloride; contains about 1 per cent. nitrogen, while from it was obtained an arabic acid (as light white powder) containing 0.67 per cent. nitrogen. The gum by the Tollens method yielded phloroglucide and methylfurolphloroglucide, representing 26.25 per cent. pentosan and 7.64 per cent. methylpentosan; its oxidation with nitric acid gives mucic acid corresponding to 16.44 per cent. galactan, while by hydrolysis l-arabinose and d-galactose were obtained. (Total arabo-galactans about 50 per cent. with arabin predominating.)

2. *The Gum of Odina Wodier*, the exudation from a tree of the Anacardiaceæ family growing in India and Ceylon, somewhat used in calico printing and paper sizing. This contains 14.12 per cent. moisture; is partly soluble in water (a table of solubility in alcohol and acetic acid is given); yields 4.36 per cent. ash consisting of 25.8 per cent. calcium, 5.04 per cent. magnesium as well as potassium, iron, chloride and silicate; contains 0.78 per cent. nitrogen; while from it was obtained an arabic acid containing 0.53 per cent. nitrogen. The Tollens process showed furophloroglucin (no methylfurophloroglucine) representing 19.17 per cent. pentosan; its oxidation with nitric acid gave mucic acid corresponding to 16.44 per cent. galactan; while by hydrolysis d-galactose and l-arabinose were obtained. (Total arabogalactan about 50 per cent., with galactan predominating).

3. *The Mucilage from Sassafras Pith* was obtained by precipitation from the infusion with alcohol, Schirmer finding the statement of the U. S. P. "not precipitated on addition of alcohol" is incorrect. By this process the mucilage was obtained as a white, difficultly pulverizable, mass (yield not mentioned) and this gelatinized with water and was insoluble in diluted alkalies and acids in ammoniacal copper oxide solution and in 80 per cent. chloralhydrate. In fact, concentrated sulphuric acid is about its only solvent and that with partial charring of the gum. It contains 0.9 per cent. nitrogen; when crude (first precipitate), has about 2 per cent. ash, which becomes less and less each time the substance is made into a jelly with water and reprecipitated with alcohol. Oxidization with nitric acid yielded saccharic acid not mucic acid. The Tollens process gives phloroglucide corresponding to 50.72 per cent. pentosan; while by hydrolysis l-arabinose and dextrose were obtained.

4. *The Mucilage from Althea Root* was obtained by precipitation from the infusion by alcohol. It is a bright yellow difficultly pulverizable mass, which is partly soluble in water, insoluble in 80 per cent. chloralhydrate and in ammoniacal copper oxide solution, but does dissolve on heating with diluted acids. The crude mucilage contains as much as 20 per cent. ash and 2.85 per cent. nitrogen. The Tollen's process gives phloroglucide corresponding to 5.47 per cent. pentosan; oxidation yields mucic acid representing 8.21 per cent. galactan, while by hydrolysis galactose and dextrose were obtained.

5. *The Mucilage from Elm Bark* was obtained by precipitation from infusion of the bark by alcohol. It was a gray hard, horny mass, which gelatinized in water, was insoluble in 80 per cent. chlo-

rallydate, in ammoniacal copper oxide solution and in alkalis. In diluted acids, it was partly soluble. It contains 1.4 per cent. nitrogen, gave, (by Tollen's process) phoroglucid and methylfuroolphloroglucide, corresponding to 12.18 per cent. pentosan and 10.26 per cent. methylpentosanes; oxidation with nitric acid yielded mucic acid representing 26.25 per cent. galactan, while by hydrolysis, dextrose, levulose and galactose were obtained.—Arch. d. Pharm., 250 (1912), Nos. 3 and 4, 230 and 241. (H. V. A.)

Aucuba Pectin—Isolation and Properties.—V. Harlay has isolated the pectin from the pulp of the fruit of *Aucuba japonica* by repeated solution in water, precipitation by alcohol, and final treatment with alcohol containing 1:1000 of hydrochloric acid, when it is ultimately obtained as a white powder containing 1.86 per cent. of ash. It gives a perfect solution in water, filtering with ease, and not reducing Fehling's reagent. Like all other known pectins, it is strongly dextrorotatory; $\alpha_D + 217.3^\circ$. This rotation is higher than that of black currant pectin. It contains galactane, since it yields mucic acid by Tollen's method.—Pharm. Journ. and Pharmacist, April 20, 1912, 511; from Journ de Pharm. et Chim., 1912, 344.

Pectin of Kalmia Latifolia—Properties.—According to E. Verdon the pectin extracted from the leaves of *Kalmia latifolia*, extracted from the alcohol-exhausted leaves by digestion with water and purified by precipitation with alcohol containing 1:1000 of hydrochloric acid, sp. g. 1.171, is a dirty white powder giving a viscous opaque solution with water, which is very difficult to filter. It contains 3.5 per cent. of ash, and 19.24 per cent. of moisture. The α_D calculated on the dry, ash-free material is $+158.62^\circ$. It is coagulated at once by pectase, and by the usual chemical reagents. It yields mucic acid on oxidation with nitric acid, and arabinose on hydrolysis with sulphuric acid. The author also describes the

Pectin of Verbascum Thapsus, which, as obtained from the alcohol-extracted mullein, is very similar to the kalmia pectin. It, however, very tenaciously retains much inorganic impurity, the ash amounting to 6.89 per cent. This is brick red in color and contains much iron. The calculated optical rotation of the ash-free pectin is $\alpha_D + 157.55^\circ$. Like *Kalmia* pectin, it gives mucic acid on oxidation and arabinose on hydrolysis.—Pharm. Journ. and Pharmacist, April 20, 1912, 511; from Journ de Pharm. et Chim., 1912, 344.

Pectin of Sweet Orange Peel—Preparation and Characters.—According to the researches of V. Harlay, the pectin of the white portion of sweet orange peel is a white substance, soluble in water, but

giving opalescent solutions. In consequence, its optical rotation can only be determined when dissolved in a solution in chloral hydrate 2 : 5. It is then found to be $+176.6^{\circ}$, closely similar to that of quince seed pectin. When hydrolysed with sulphuric acid, it yields arabinose. The hydrolysis products yield mucic acid by Tollen's method. To obtain it, the dried white peel is first extracted with several portions of boiling alcohol. The residue is tried, macerated with water, and strained. The pectin is precipitated by alcohol and purified by re-solution in water and re-precipitation as above. It is finally washed with ether. It still retains a large amount of inorganic matter.—Pharm. Journ. and Pharmacist, April 27, 1912, 537; from Journ. de Pharm. et Chim., 1912, 345.

Saccharose—Detection and Estimation in Presence of Other Sugars.—L. K. Hirschberg recommends the following method for the detection and estimation of saccharose associated with sugars of the glucose group in urine and other secretions. The suspected fluid, after sterilization, is mixed with an equal volume of 1/5 N. soda solution and placed for 24 hours into the incubator; or, more rapidly, in case bacterial and other impurities are suspected, by boiling the mixture 45 minutes. By this treatment dextrose, mannit, maltose, mannose, lactose, levulose, galactose, and invert sugar, are completely destroyed, whereas saccharose remains perfectly unchanged and may at once be identified and estimated by polarization.—Pharm. Ztg., lvii (1912), No. 30, 302; from Ber. klin. Wetschr., 1912, No. 9, 409.

Saccharose—Determination in Foods.—S. Rothenfusser has devised a method for the determination of saccharose in natural and artificial food products which depends upon the preliminary treatment of their suitably prepared solution with strong alkaline solutions and, simultaneously, with weak solution of hydrogen peroxide and heat. By this treatment the associated sugars and other reducing organic substances are completely destroyed, whereas saccharose remains unchanged, and may be determined quantitatively with diphenylglacial acetic acid, and finally polarimetrically. The author gives explicit directions for its estimation in fermentative products, in milk, honey, flours, etc.—Pharm. Ztg., lvii (1912), No. 99, 999; from Zschr. f. Unters. d. Nahr.-u. Genussm., 24 (1912), No. 9.

Purified Caramel—Preparation.—In an elaborate review of the various propositions that have been made for preparing a standardized solution of caramel for the purposes of the National Formulary, Mr. George M. Beringer discusses the difficulties attending the solu-

tion of this problem, and particularly the proposed introduction into the N. F. of a formula for the preparation of caramel by pharmacists themselves. A practical difficulty arises in carrying out the proposed formula that the odorous vapors and fumes given out at the temperature required for efficient caramellization, unless they are carried off under a hood connected with a good draft, soon fill the entire building, making it impracticable for the average pharmacist to make it satisfactorily and economically, not to speak of the liability of variation in composition when made on a small scale by different individuals. But the most serious objection lies in the fact, that a formula for caramel though not in keeping with the commercial-process, and even though inferior, becomes the legal standard for all caramel by whomsoever made. For these reasons Mr. Beringer has experimented and has devised a method for purifying the caramel of commerce by the following method, which is based upon the precipitation of the caramel colorings by strong alcohol:

Caramel	1000 Gm.
Alcohol	3500 Cc.
Monohydrated sodium carbonate.....	4 Gm.
Water.....	a sufficient quantity.

To the caramel in a capacious bottle add 250 Cc. of boiling water, mix thoroughly, gradually add 3000 Cc. of alcohol, shaking after each addition, and set aside for six hours. Then decant the alcohol onto a filter and wash the residual caramel color with two portions of 250 Cc. each of alcohol; decanting the alcohol each time onto the filter. Drain the alcohol thoroughly from the precipitate and dissolve the latter in 1500 Cc. of warm water, add the monohydrated sodium carbonate to the solution, filter, and evaporate to a thick syrup. Spread this upon sheets of glass so as to form scales, scraping them off when completely dry, and finally expose the "purified caramel" in a desiccator over sulphuric acid until it ceases to lose weight. Obtained in this way

Purified Caramel is in dark brown, shining, translucent scales, free from bitterness, without any perceptible sweet taste, and practically odorless. It is non-hygroscopic and dissolves readily in water and in diluted alcohol, producing clear solutions. The yield averaged 37 per cent., and had a tinctorial power three times that of the caramel from which it was prepared.

Tincture of Caramel, suitable for the purposes of the N. F., may be made by the following formula:

Purified caramel.....	50 Gm.
Ammonia water.....	10 Cc.
Water	740 Cc.
Alcohol	250 Cc.

Mix the liquids and dissolve the purified caramel in the mixture. Filter if necessary. This tincture appears to be permanent and can be used as a coloring direct, or may serve for standardizing commercial caramel, a dilution of 1 Cc. of the tincture to 199 Cc. of water, answering this purpose admirably.—*Amer. Journ. Pharm.*, April, 1912, 160 to 166.

Milk Sugar—Contamination with Bacteria.—Experiments made by Dr. H. Kühn to determine the queries whether commercial milk sugar is contaminated with *bacteria*, and if so, what is their nature, convince him that commercial milk sugar frequently does not respond to hygienic requirements, and that besides inorganic and nitrogenous impurities, as has already been pointed out by others, it also contains bacterial impurities which, in some cases, are of an exceedingly dangerous nature.—*Pharm. Ztg.*, lvii (1912), No. 11, 105; from *Südd. Apoth.-Ztg.*, 1912, No. 1.

Sugar of Milk—Inferiorities Due to Careless Manufacture.—In response to complaints regarding the quality of sugar of milk, supplied to infant food manufacturers, Ernest J. Parry examined nearly one hundred samples during the past twelve months. The principal points to which exception had been taken are color, odor, solubility, and liability to decomposition. Mr. Parry finds that this article is rarely deliberately adulterated; indeed, not one of the samples examined contained any added matter. Of seven samples objected to on account of color, six were faintly yellow, one particularly marked, the seventh having a decided bluish tint; but all of them were practically of 100 per cent. lactose value. Five samples were objected to on account of odor, of which one was evidently due to storage in proximity to some strong smelling substance, while the others had a "cheesy" odor, probably due to the presence of a trace of casein. To the presence of this the author also attributes the incomplete solubility of five other samples, as well as the liability to decomposition manifested by several samples, coupled with the fact that the casein itself was not pure. Such milk sugar was liable to undergo fermentation, whereas in the presence of pure sterile casein no fermentation was observed. The faulty samples, as far as the author could

ascertain, were either of Italian or French manufacture. The great majority of samples, however, fully complied with the most stringent requirements both of the B. P. and of the most exacting consumer.—*Chem. and Drugg.*, Dec. 21, 1912, 931.

Sacchulose—The Sugar Produced from Wood.—A. Zimmerman explains that when wood meal or sawdust is subjected to treatment by the "Classen" process, with weak sulphurous acid under pressure, it undergoes various chemical changes, the most important being the formation of about 25 per cent. of a sugar, consisting to the extent of 80 per cent. of fermentable sugar, the remainder apparently being pentose, or non-fermentable sugar, the name given to the product being "Sacchulose." Comparing the composition of sawdust with that of the transformed product, there are found, before conversion: Ash, 0.7 per cent.; sugar, none; other carbohydrates soluble in acid and alkali, 31.0 per cent.; insoluble carbohydrates, 68.3 per cent. After conversion, the items stand thus: Ash, 0.7 per cent.; sugar, 25 per cent.; other carbohydrates soluble in acids and alkali, 18.0 per cent.; insoluble carbohydrates, 56.3 per cent. It has not yet been possible to produce a crystalline product on a commercial scale, but improvements have been made in the quality of the product; "sacchulose" having already produced excellent results as a feeding stuff (for horses), and promises well in other directions—notably in the manufacture of alcohol.—*Pharm. Journ. and Pharmacist*, Dec. 14, 1912, 749; from *Journ. Roy. Soc. Arts*, Dec. 6, 1912, 69.

Galactocides—Formation by the Biological Method.—Promising a detailed account of their experiments, Bourguelot and Herissey stated at a meeting of the Société de Pharmacie de Paris, (Oct. 2, 1912) that by the action of lactase of almond emulsion on galactose in alcoholic solution they had succeeded in obtaining a colorless, hygroscopic, crystalline compound, which would probably prove to be a galactocide. The production of this organic compound by a process analogous to that already successful with glucose and a number of alcohols is considered of interest and importance.—*Pharm. Journ. and Pharmacist*, Nov. 9, 1912, 581; from *Journ. de Pharm. et Chim.*, 1912, 6, 371.

Glucose—Influence of Peptones on its Valuation by Fehling's Solution.—According to the experiments of A. Bernardi the presence of peptone in sugar solutions has the effect of giving too high value in determination of glucose by means of Fehling's solution. Accurate readings are however obtained if the cuprous oxide is afterwards

converted into sulphocyanide, or if the peptone is precipitated by phosphotungstic acid before making the determination, even though present in quantity double that of the glucose.—Pharm. Ztg., lvii (1912), No. 47, 478; from Bioch. Ztschr., 41 (1912), 160-164.

End-reaction in Glucose Estimation.—Jacobs, Francis Brinton, outlines a modification of several well-known methods for determining the end-reaction in the estimation of glucose. He proposes the use of reagents on a porcelain plate in which are several depressions, and in place of extracting several Cc. of the liquid, the tests are made with drops of the solution so that only three or four drops of the Fehling's solution will be removed from the beaker.—J. Am. M. Assoc., 1912, v 59, pp. 440-441. (M. I. W.)

Fehling's Solution—Use.—Hunter, John W., in outlining a new method for using Fehling's solution, points out that the principal difficulty in the use of this reagent is the determination of the end-point of the reaction. The principal on which his method depends is that of separating the more or less clear supernatant fluid into two adjacent layers by heating the upper portion and then comparing these two layers after the reducing substance has been added to the upper hot layer. If there is reducible copper in the fluid the upper layer will show a reddish tinge whose density will depend on the amount of copper reduced.—J. Am. M. Assoc., 1912, v 59, p. 441. (M. I. W.)

ORGANIC ACIDS.

Potassium and Sodium Salts of Organic Acids—Suggestion of Improved Assay Process for the U. S. P.—In a paper read in the Division of Pharmaceutical Chemistry, Americal Chemical Society, December, 1909 (see Amer. Journ. Pharm., 1910, 63-68), Seidell and Wilbert called attention to the incomplete extraction by boiling water of the incinerated residue remaining under the conditions of the U. S. P. process of assay, and suggested as a possible remedy the reincineration of the residue after washing with boiling water and uniting the washings from this with those first obtained. In the case of sodium benzoate this procedure yielded fairly satisfactory results, but great caution appears to be necessary to prevent loss during the carbonization by not exceeding a temperature beyond a red heat. Elias Elvove, now taking up the same subject, conceived that probably a safer procedure might be based on the transformation of the potassium and sodium into their highly stable and non-volatile sulphates—a procedure actually adopted by the present U. S. P. in the case of the organic lithium salts, and as a result of some prelimi-

nary experiments, he has developed a mode of procedure which has yielded satisfactory and reliable results. Omitting details, this may be described as follows:

Portions of the samples in powdered form, generally about 0.5 Gm., were placed in platinum dishes (100 Cc.), dissolved in a sufficient amount of hot water, and treated with N/1 H_2SO_4 amounting to about one-third to one-half the quantity in excess of that theoretically required. The dish, covered with a piece of platinum foil, was placed in a drying oven, the temperature of which was gradually increased from 100°C. to about 150°C. , and generally allowed to so remain about 30 minutes; whereupon it was ignited by means of a Bunsen burner while still loosely covered by the platinum foil, increasing the temperature gradually up to red heat, continuing the ignition at red heat for 10-15 minutes, then allowed to cool and weighed in the usual way. The ignition was repeated for another period of 10 minutes, and the weight ascertained as before; and this weight being usually practically the same, the results of the second ignition were usually accepted as final.

In this way, with some modification in the case of individual salts, which are described, Mr. Elvove assayed from 10 to 12 samples of each of the following commercial salts, obtained from different firms, with the results exhibited in as many tables, showing the amount taken for the analysis, the weight of sulphate found, the theoretical weight of sulphate, and the purity of the sample: Potassium Citrate; Potassium Bitartrate; Potassium Sodium Tartrate; Potassium Acetate; Sodium Benzoate; Sodium Citrate; Sodium Salicylate; and Sodium Acetate. These results show that, on the whole, the U. S. P. requirements of purity are not unreasonable when assayed by the process suggested. In one case only, "Sodium Benzoate," only 2 of 9 samples examined complied with the U. S. P. purity requirements of "not less than 99 per cent." About half the samples, however, showed a purity of over 98 per cent., and with one exception all the others assayed within a fraction of 98 per cent. The requirement of a minimum purity of 99 per cent. for "Sodium Benzoate" is therefore apparently a little too high, and it might, in the author's opinion, be well to reduce it to 98 per cent. with a stipulation as to what the remaining 2 per cent. should consist of. —*Amer. Journ. Pharm.*, July, 1912, 289-298.

Benzoic Acid—Use as an Acidimetric Standard.—Geo. W. Morey states that benzoic acid possesses many advantages as a standard in acidimetry, in that its high molecular weight permits of the use of large samples, thus reducing the error of weighing; its stability and

lack of hygroscopicity make its use very convenient; the ease of obtaining it in a high state of purity and the simplicity and rapidity of the method make it an excellent material to use as a standard in acidimetry and alkalimetry.

The benzoic acid was purified by recrystallizing twice from alcohol, once from water, and then fractionally subliming in vacuo.

Because of the bulkiness of the sublimed benzoic acid, its bulk was condensed by placing it in a covered platinum dish and melting by placing in an oven heated to 140° C. When melted, the liquid was poured into a test tube, allowed to solidify, and the stick so obtained broken into pieces of convenient size, and preserved in a glass-stoppered bottle.

To use as a standard, weigh out about 1 Gm. of this material, place in a 300 Cc. flask, add 20 Cc. alcohol, and allow to dissolve. Add three drops of a 1 per cent. solution phenolphthalein and titrate with N/10 alkali, the CO_2 being removed from the flask by means of a current of CO_2 free air.

A 7 per cent. transformation of the indicator was the end point selected, the effect of the alcohol on the end point being determined by means of a blank experiment.

The results obtained by the above method compared very closely with that obtained by means of standard hydrochloric acids prepared by the distillation method of Hulett & Bonner, the gravimetric silver chloride method, and standard sulphuric acid, standardized gravimetrically by the barium sulphate method, and by the sodium oxalate method.—Journ. Am. Chem. Soc., August, 1912, Vol. 34, p. 1027. (L. A. B.)

Methylcyclopentenolon—*A New Cyclic Body in Wood Vinegar*.—Dr. J. Meyerfeld describes a new cyclic body which he has found in wood vinegar. In its perfectly pure condition it is a colorless solid, melting at 106° C., sublimes readily, and boils at 210° C. with slight decomposition, but may be distilled without decomposing in a partial vacuum; odor peculiar and agreeable; taste sweet, slightly acid, reminding of licorice or fresh walnuts; readily crystallizable, and very soluble in hot water, methyl alcohol, ethyl alcohol, acetic ether, acetone, chloroform, and carbon tetrachloride, but sparingly soluble in cold water, ethyl ether, and petroleum ether.—Pharm. Ztg., lvii (1912), No. 47, 472; from Chem. Ztg., 1912, No. 59.

Benzoic Acid—*Expeditions and Reliable Method of Determination in Food Products*.—In his report to the German War Department, (Sanitary Division), Staff-Apothecary Biernath recommends the method of A. Jonescu for the detection of benzoic acid in food prod-

ucts as being quite sensitive and expeditious, requiring with the aid of distillation not more than fifteen minutes. The reaction consists in the addition of one drop of 1 per cent. ferric chloride solution and 3 drops of a 1 per cent. H_2O_2 solution to the distillate, and is available in the presence of 0.001 Gm. of benzoic acid in the food under examination. The presence of mineral acids, volatile and fatty and other acids must be excluded. Salicylic acid is completely destroyed and excluded if after the distillation of the material under examination with 0.5 Gm. of sulphuric acid and 20 Cc. of water, the distillate is treated with alkaline potassium permanganate, then redistilled, and the distillate tested by Jonescu's reaction.—Pharm. Ztg., lvii (1912), No. 18, 176.

Benzoic Acid—New Method of Detection.—O. Schmatolla has devised the following new method for the detection of benzoic acid: About 20 Cc. of a solution (in distilled water) of the suspected substance are mixed at the ordinary temperature with 5 Cc. of pure hydrogen peroxide; then a freshly prepared solution of 5.0 Gm. crystallized ferrous sulphate and 5.0 Gm. boric acid in 100 Cc. of distilled water is gradually added, with continuous rotation, until the resulting color no longer becomes darker. In the presence of benzoic acid a deep dark-green precipitate forms within a few seconds. Heating does not favor the reaction.—Pharm. Ztg., lvii (1912), No. 94, 947.

Sodium Iodoxybenzoate.—Amberg and Knox, in reporting some observations on the influence of sodium iodoxybenzoate on reactions of inflammatory character, state that this substance inhibits a certain phase of an inflammatory reaction, while sodium cyanide intensifies it.—J. Am. M. Assoc., 1912, v. 59, pp. 1598-1599. (M. I. W.)

Saccharin—Limitation of Innocuousness.—An editorial (J. Am. M. Assoc., 1912, v 58, p. 117) calls attention to the Referee Board report on saccharin, and points out that the main general conclusions are that saccharin in small quantities, 0.3 Gm. per day or less, is without deleterious or poisonous action and that in quantities of more than 0.3 Gm. per day, and especially over 1 Gm. per day, when taken for considerable periods of time, is liable to induce disturbances of digestion. While the admixture of saccharin to food does not appear to alter the quality or strength of the food it is obvious that its addition as a substitute for cane-sugar must be regarded as a substitution involving a reduction of the food value of the product and hence a reduction in its quality.—(M. I. W.)

Citrophosphates—Hypothesis of Their Solution.—According to A. Quartaroli the solvent action of ammonium citrates on the phosphates of the alkaline earths may be explained on the hypothesis of the formation of complex salts, with a corresponding diminuation of the alkaline earth cations and the PO_4 anions. Pratolongo, however, has suggested that a double decomposition occurs, and Quartaroli has therefore performed a new series of cryoscopic experiments with solutions of ammonium citrate. The results confirm his previously suggested hypothesis of the formation of complex salts.—Chem. News, March 29, 1912, 156; from Atti della Reale Accad. dei Lincei, xxi (1912), No. 2.

Iron and Quinine Citrate, G. P. V—Improved Assay of Quinine.—E. Mannheim criticises the method of the G. P. V. for the assay of quinine in iron and quinine citrate, and recommends the following improved process: 1.2 Gm. of iron and quinine citrate are dissolved in a 150 Gm. vial in 5 Gm. of water; then 60 Gm. of ether and 10 Gm. solution of ammonia are added, and the vial is well shaken for 15 minutes. After standing several minutes the lower aqueous layer is removed with a pipette, and 50 Gm. of the remaining ethereal solution of quinine (=1.0 Gm. of the salt taken) is filtered through a plaited filter into a tared flask. The ether is evaporated at a gentle heat and the residual quinine is then heated for 1 hour to dryness. It should weigh not less than 0.081 Gm.=8.1 per cent.—Apoth. Ztg., xxvii (1912), No. 3 and 4, 25 and 34.

Ferri, Quininæ et Strychninæ Citras, B. P. C.—Analysis.—Walter Ryley Pratt gives the details of experiments undertaken to find a suitable method for the analysis of the B. P. C. "Ferri Quininæ et Strychninæ Citras." His results lead to the conclusion that the method of the U. S. P. for the assay of *iron* in scale preparations should be adopted. For the estimation of *total alkaloid* the method of the B. P., requiring the use of chloroform, is to be preferred over the methods requiring ether for the extraction; while for the *strychnine* the method for its determination in the presence of quinine, described by Harrison and Gair (Pharm. Journ., 1903, 165 and 216), should be adopted for the analysis of this preparation of the B. P. C.—Pharm. Journ. and Pharmacist, March 16, 1912, 359-360.

Silver Citrate—Preparation and Properties.—According to C. K. Schuster, silver citrate, chemically identical with "Itrol," is prepared by mixing neutral solutions of sodium citrate and silver nitrate. It occurs as a white powder, tasteless and odorless, requir-

ing 3800 parts of water for solution, but is readily dissolved by dilute nitric acid or ammonia; insoluble in alcohol, ether, and chloroform. The salt is identified by dissolving it in diluted nitric acid and precipitating the silver in one portion of the solution with hydrochloric acid; from another portion of the solution the silver is precipitated with caustic soda, the filtrate neutralized with nitric acid and then made slightly alkaline with ammonia; on then adding calcium chloride and boiling well, calcium citrate is precipitated and may be identified by its microscopic appearance. To prove the absence of silver nitrate, 0.5 Gm. of the salt is shaken with 20 Cc. of alcohol and filtered; the filtrate should not become opalescent on addition of dilute hydrochloric acid.—Pharm. Journ. and Pharmacist, Oct. 12, 1912, 455; from Ztschr. d. Allgem. Oesterr. Apoth. Ver., June 22, 1912, 305.

Formic Acid—Estimation.—According to A. Fouchet, formic acid or in mixture with its higher homologues may be estimated by the method here described, for which the following reagents are required: (1) Potassium permanganate, 5 Gms. per litre (1 Cc.=1.25 Mgm. O); (2) Sodium carbonate, crystals, 50 Gms. per litre; (3) a solution of ammoniacal ferrous sulphate, 20 Gms., sulphuric acid, 30 Gms., in water, q.s. to make 1 litre; (4) Sulphuric acid of 50 per cent. by volume. Into two Erlenmeyer flasks, 40 Cc. of the sodium carbonate solution and 20 Cc. of the permanganate solution are placed. To one of the flasks, 0.05 Gm. of the substance to be examined, previously dissolved in a little water, is added; to the other flask the same quantity of pure water. If the formate is present only in small quantity in the mixture, the permanganate solution used may be more dilute (1 per cent.). The two flasks are kept on a water-bath for three minutes at 80°, when they are cooled, and to each is added 20 Cc. of the diluted sulphuric acid and 50 Cc. of the ferrous sulphate solution. The excess of the last is determined in each flask by the permanganate solution used, 5 per cent. or 1 per cent. as the case may be. The difference between the volumes of the permanganate run into each flask to produce a rose-tint represents the quantity of KMnO_4 used up by the formic acid, according to the reaction $3(\text{HCOOH}) + 3\text{O} = 3\text{CO}_2 + 3\text{H}_2\text{O}$. Each Cc. of the permanganate solution=1.25 Mgm. of oxygen or 5/64 molecule of formic acid, or in weight 3.51 Mgm.—Pharm. Journ. and Pharmacist, May 11, 1912, 607; from Bull. Sci. Pharmacolog, March, 1912, 149

Formic Acid—The Detection in Fruit Products.—F. L. Shannon, in commenting upon the use of formic acid as a preservative of fruit products, suggests the following method of procedure as a means of detecting formic acid in such products.

Place 200—500 Cc. of the syrup or crushed fruit in a two liter, long-necked, round-bottom flask, provided with a Reitmeier bulb, add 50—100 Cc. water, and distill over by means of steam, about 2500 Cc. distillate, or until distillate ceases to react acid to litmus. Neutralize the distillate with N/I NaOH, using litmus as an indicator. Evaporate to about 50 Cc. and transfer to an Erlenmeyer flask, provided with a reflux condenser, add a few pieces of pure magnesium wire and a slight excess of dilute sulphuric acid and set in a cool place for one hour, adding more sulphuric acid if necessary.

Transfer liquid to suitable distilling flask, and collect the first ten Cc. of the distillate and apply tests for formaldehyde.

As an additional means of detection, it is recommended that the lead salt of formic acid be formed and isolated and subjected to appropriate tests for identification.—Journ. Ind. and Eng. Chem., July, 1912, vol. 4, p. 526. (L. A. B.)

Commercial Formates—Revision of the Formulas Given in the B. P. Codex.—Asked to supply sodium formate answering the requirements of the B. P. Codex, Thomas Tyrer and F. C. Gosling found the article in stock to be in well-defined prismatic crystals containing two molecules of water of crystallization, instead of one as stated in that work. The authors were unable to prepare *Sodium Formate* containing only 1 molecule of water, and recommend, in accordance with their experience and the variation in water content of six commercial samples, from nil to 36 per cent., that the formula should be amended to 2 molecules of water for the true crystallized salt ($\text{NaCHO}_2 \cdot 2\text{H}_2\text{O}$).

Other chemical formulas for formates were also investigated and the corrections made, as shown in the following summary:

	B. P. C. Formula	Established Formula
Sodium formate.....	$\text{NaCHO}_2 \cdot \text{H}_2\text{O}$	$\text{NaCHO}_2 \cdot 2\text{H}_2\text{O}$
Potassium formate.....	KCHO_2	KCHO_2
Lithium formate.....	$\text{LiHCO}_2 \cdot \text{H}_2\text{O}$	$\text{LiHCO}_2 \cdot \text{H}_2\text{O}$
Calcium formate.....	$\text{Ca}(\text{CHO}_2)_2$	$\text{CaC}_6\text{H}_2\text{O}_4$
Ferric formate.....	$\text{FeC}_6\text{H}_6\text{O}_{12} \cdot \text{H}_2\text{O}$	$\text{Fe}_2(\text{CHO}_2)_6$
Ferrous formate.....	$\text{Fe}(\text{CHOO})_2$	$\text{Fe}(\text{CHO}_2)_{2.2}\text{H}_2\text{O}$

—Trans. Brit. Pharm. Conf. (Yearbook of Pharm.) 1912, 432-434.

Hippuric Acid—Compounds with Barium and with Iron.—E. Bötcker states that barium hippurate may be made by neutralizing hippuric acid with baryta and crystallizing from water; when dried on filter paper at room temperature the crystals were found to have the formula $\text{Ba}(\text{C}_9\text{H}_8\text{O}_3\text{N})_2 \cdot 5\text{H}_2\text{O}$, being thus isomorphous with the strontium salt obtained by Schwarz. The barium salt prepared by the latter and dried over sulphuric acid only contained 1 molecule of water. Hippurate of iron can scarcely be said to exist as a definite substance; on adding an alkali hippurate to a slightly acid solution of ferric chloride basic iron chloride is precipitated, but the hippuric acid is only partly precipitated with it.—Pharm. Journ. and Pharmacist, March 30, 1912, 421; from Chem. Ztg., January 27, 1912, 105.

Lactic Acid—Reactions.—C. Reichard has made comprehensive investigations of certain lactic acid reactions, and describes a number that are particularly characteristic, such, for example as those obtained with potassium dichromate, ammonium heptamolybdate, and potassium ferricyanide. The addition of a little pulverized potassium dichromate to a drop of lactic acid produces gradually, over blue-green, a nickel-green coloration, while ammonium heptamolybdate produces under the same conditions at first a sky-blue color, also gradually changing to nickel-green. A solution of potassium ferricyanide yields with lactic acid a characteristic yellow coloration.—Pharm. Zentral., liii (1912), No. 3, 51-56.

Calcium Lactate—Method of Preparing a Pure Salt.—The experiments of C. A. Hill and T. T. Cocking demonstrate that calcium lactate is liable to vary in composition according to the method of preparation, varying particularly in the amount of water of crystallization. It may be neutral or contain either lactic acid, calcium hydroxide, or calcium carbonate. Pure calcium lactate is readily prepared by precipitation of its cold saturated solution with acetone, washing the precipitate with acetone and then with ether. A product thus prepared was neutral to phenolphthalein, and contained 70.07 per cent. of anhydrous calcium lactate calculated on the yield of 0.1394 gram of calcium sulphate from 0.3187 gram of the substance. The proportion of anhydrous calcium lactate calculated for the pentahydrated salt is 70.78 per cent. Regarding the solubility of calcium lactate, the authors have been unable to confirm the oft-repeated statements that the salt becomes insoluble with age. The widely divergent statements made in regard to its solubility do not

appear capable of explanation on the ground that they were possibly made at different temperatures or with salts of varying hydration. In determining the solubility of calcium lactate care must be taken that the temperature does not rise above the point for which the observation is to be recorded, since solutions of calcium lactate appear to exhibit supersaturation in a marked degree. Experiments made by a method described, giving very concordant results, show the mean solubility of the hydrated salt ($\text{CaC}_6\text{H}_{10}\text{O}_6 \cdot 5\text{H}_2\text{O}$) to be as follows: At 0°C ., 1 in 32; at 15°C ., 1 in $18\frac{1}{2}$, and at 30°C ., 1 part of salt in $12\frac{1}{2}$ parts of water.

The authors recommend the salt to be made official (B. P.) should be the hydrate $\text{CaC}_6\text{H}_{10}\text{O}_6 \cdot 5\text{H}_2\text{O}$; that it be required to be neutral, or very slightly acid with a limit of acidity stated; and that it be required to yield upon treatment with sulphuric acid, ignition, further treatment with sulphuric acid and re-ignition, not less than 41 or more than 45 per cent. of its own weight of calcium sulphate. Limits of lead and of arsenic should also be introduced.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1912, 481-485.

Oxalates—Poisonous Action and the Physiological Functions of Calcium.—O. Loew observes that, although the poisonous effect of oxalates on vertebrates has been long known, it is only recently that Schimper has observed that plants are susceptible to this action. The author has examined the action of potassium oxalate on algæ and the low animal organisms found in water, and found that this substance acts as a poison, except towards those forms which do not require calcium. The poisonous action is connected with the physiological effect of calcium. Observations on plants show that the oxalates act upon the nucleus and chloroplasts, from which it is inferred that a compound of calcium exists in these structures. It, therefore, appears that a calcium compound is present also in the nuclei of animal cells.—Pharm. Journ. and Pharmacist, March 16, 1912, 353; from Biochem. Ztschr., 38 (1912), 225.

Potassium Binoxalate vs. Salts of Sorrel.—Thomas Tyrer and F. C. Cosling observe that "salts of sorrel" as understood in the trade usually consists of potassium quadroxalate, but that this is not coincident with the salts of sorrel B. P. C., and it is presumed from the description that same latitude is allowed in respect of this article. Binoxalate is $\text{KHC}_2\text{O}_4(\text{H}_2\text{O})_2$. Allen says $1\text{H}_2\text{O}$. Quadroxalate is $\text{KH}_3(\text{C}_2\text{O}_4)_2(\text{H}_2\text{O})_2$.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1912, 434.

Iodo-Compound of Gallic Acid—Presumably the Active Component of Iodo-tannic Solutions.—C. Courtot has investigated and separated a compound of gallic acid and iodine which he believes to be the active constituent of the iodotannic solutions and syrups largely used in French pharmacy. He has obtained it in a definite microcrystalline form by evaporating iodotannic solutions, *in vacuo*, over sulphuric acid. It is neutral, very hygroscopic, and readily parts with its iodine.—Pharm. Journ. and Pharmacist, Oct. 5, 1912, 421; from Journ. de Pharm. et Chim., 1912, 6, 253.

Pyrogallol—Oxidation by Hydrogen Peroxide.—If a mixture of 10 Cc. of a 10 per cent. solution of pyrogallol and 20 Cc. of a 40 per cent. solution of potassium carbonate and 10 Cc. of a 35 per cent. solution of formaldehyde are added to 500 Cc. of a 30 per cent. solution of hydrogen peroxide contained in a capacious vessel, the oxidation takes place so rapidly that flames are evolved.—Farm. Notisbl. 1912, Nr. 10. (O. R.)

Pyrogallie Acid—A Sensitive Identity Reaction.—C. Glücksmann recommends the following reaction for the identification of pyrogallie acid, which is available in dilutions of 1:100000:—A trace of pyrogallie acid is dissolved in about 1 Cc. of concentrated acetic acid, a few drops (3-5) of formaldehyde solution is added, and the mixture is heated to boiling. The hot mixture remains colorless, but on addition of several drops of concentrated hydrochloric acid an immediate intense, magnificent, cherry-red color is developed, which on further dilution with concentrated acetic acid and corresponding to the degree of dilution changes to a pure rose-red. A precipitate is not formed.—Pharm. Ztg., lvii (1912), No. 37, 373; from Pharm. Praxis, 1912, No. 3.

Pyrocatechin-ferric Acid—Conditions of Formation.—According to R. F. Weinland and Karl Binder, iron chloride gives a dark red coloration with a concentrated solution of pyrocatechin in concentrated caustic potash. If ferric acetate is used instead of the chloride a similar dark red solution is obtained, and from this crystals of pyrocatechin-ferric acid, $\text{Fe}(\text{C}_6\text{H}_4\text{O}_2)_3 \cdot 2\text{H}_2\text{O}$, separate. Corresponding ammonium and sodium salts can be obtained. If a ferrous salt is substituted for the ferric salt the same compound is formed, the oxygen of the air converting the divalent into trivalent iron.—Chem. News, March 15, 1912, 132; from Ber. d. D. Chem. Ges. 45 (1912), No. 1.

Salicylic Acid—New Reactions.—E. Barral describes several new reactions for salicylic acid:

1. Two drops of the solution to be tested (e. g., sodium salicylate, 5 per cent.) are shaken in a test tube with about 2 Cc. of pure concentrated sulphuric, allowed to cool, and a 10 per cent. solution of sodium nitrite is then added, drop by drop, directly on the acid mixture, shaking after each drop, whereupon the following tints appear in succession: Orange-yellow, reddish-orange, blood-red with green fluorescence, and finally currant-red. On adding water to the solution, the red coloration is replaced by an orange tint, slightly dicroic. The reaction is very sensitive with salicylic ethers, such as an alcoholic solution of methyl salicylate, for example.

2. To 2 or 3 Cc. of a 1 per mille. solution of salicylic acid, ammonium persulphate, in bulk about as large as a pea, is added. On boiling, the liquid becomes gradually yellow, turns brown, then becomes turbid and forms a brownish-black precipitate (deeper as there is more salicylic acid), leaving the supernatant liquid colorless or yellowish.

3. On placing a drop of dilute solution of salicylic acid on a glass plate by the side of a drop of Mandelin's reagent, blue striae form on mixing the two drops, rapidly becoming green and very stable.

4. On adding Schlagdenhaufen's reagent to a solution of a salicylate (aspirin, methyl salicylate, sulphosalicylic acid, etc.) in the cold, a yellow coloration is gradually produced and on heating this moderately, the tint becomes orange and brownish orange; then a red precipitate of selenium is formed and selenuretted hydrogen is disengaged. Finally, on longer heating a black precipitate is formed.—Pharm. Journ. and Pharmacist, Aug. 10, 1912, 201; from Bull. Soc. Chim. de France, April 20, 1912, 417.

Salicylates—Relative Value of Natural and Synthetic.—There is a fairly widespread belief among physicians and pharmacists that the salicylic acid which is derived from the natural oil of winter-green or sweet birch, and the sodium salt of this acid, are to be preferred to the corresponding synthetic preparations. Carey Eggleston (J. Am. Med. Assoc., 1912, v. 59, pp. 2057-2064) reports a rather comprehensive study of the literature on the subject in an effort to locate definitely the reasons for the belief if reasons are to be found. He presents rather a comprehensive reflection of the literature and concludes that the evidence in favor of the "natural" salicylates is extremely slight the bulk of the evidence indicating that physicians all over the world have demonstrated the artificial salicylates to be quite as effective as the "natural" and no more liable to produce unfavorable actions under similar conditions. (M. I. W.)

Sodium Salicylate—Effects and Toxicity of the Natural and Artificial Salt.—An editorial (J. Am. M. Assoc., 1912, v. 58, p. 116) calls attention to a report on a comparative investigation of the effects and toxicity of sodium salicylate of natural and synthetic origin. The investigation, an experimental one on three widely different classes of animals, cats, rabbits, and dogs, did not show the slightest difference, either in toxicity or any of the symptoms produced by the different samples of sodium salicylate that were used. (M. I. W.)

Calcium Acetylsalicylate—Preparation.—Michael Máthé prepares calcium acetylsalicylate as follows: Quick lime is slacked with as little water as possible, then suspended in alcohol and diluted (alcoholic) solution of acetylsalicylic acid, followed afterwards by a more concentrated solution, is added with continuous stirring. An albumenlike coagulum of calcium acetylsalicylate is formed, which is pure white when the process is carefully conducted—though liable to assume a rose color by careless manipulation. The coagulum is collected on a filter, the alcohol drained off, and the calcium salt thoroughly washed with ether and dried at 40°—50°C. As is the case with the other salts of acetylsalicylic acid, the calcium salt is prone to hydrolytic decomposition with formation of acetic acid, but in a less degree, complete decomposition not resulting even after a long time.—Pharm. Ztg., lvii (1912), No. 55, 554; from Pharm. Post, 1912, No. 45 and 46.

Mercuric Salicylate—Simple Method of Assay.—Mentioning some improvements necessary to perfect the G. P. method for the valuation of mercuric salicylate, R. Brieger proposes the following new method which gives equally reliable results and excels in simplicity: 0.5 Gm. of the mercuric salicylate is dissolved in 30 Cc. of N/10 potassium hydroxide solution with the aid of heat; the solution is diluted with 100 Cc. of water and, after the addition of a few drops of solution of nitrophenol, 30 Cc. of N/10 hydrochloric are added, and then titrated with N/10 potassium hydroxide solution until a yellow color is developed. From the difference in the number of Cc. of alkali consumed and the number of Cc. of acid used, the amount of salicylic acid present is calculated, 1 Cc. corresponding to 0.0138 Gm. of salicylic acid. If then the percentage of salicylic acid is deducted from 100 and the product multiplied by 0.5952, the percentage of mercury in the preparation is ascertained.—Arch. d. Pharm., 250 (1912), No. 1.

Sodium Salicylate—Modification of the G. P. Test for Chloride.—The German Pharmacopœia directs for the determination of the

absence of chlorides in sodium salicylate that 2 Cc. of an aqueous solution of the salt (1:20), acidulated with nitric acid, must not be changed on addition of silver nitrate solution. Dr. T. Bohrisch, having obtained a milky white reaction with samples of sodium salicylate of reliable manufacture, suspected the reaction to be due to other causes than the presence of chloride, and by experimentation determined that if the salt solution is simply acidulated (with 1 to 3 drops of the acid) a milky turbidity invariably occurs, but when nitric acid is added in decided excess no precipitation results. The G. P. test should therefore be modified in accordance with this observation.—*Pharm. Ztg.*, lvii (1912), No. 19, 190.

Tannin—Composition.—K. Feist reports his study of tannin obtained from Turkish and from Chinese nutgalls. He reviews his prior work of obtaining from commercial tannin a pure crystalline body, which he called gluco-gallic acid, and he now discusses its preparation from Turkish galls (by extraction in Soxhlet's apparatus first with chloroform, then with benzene to remove fat, wax and other impurities, and then removal of the pure body by extraction with absolute ether) and the physical properties of the gluco-gallic acid, including optical rotation $[\alpha]D^{17} = +10.6^\circ$. He finds that glucogallic acid has the molecular weight 318.2 (calculated by titration with N/10 alkali) or 315 (by increase of boiling point); that one molecule of it hydrolyses to one molecule of gallic acid and one molecule of glucose; that it contains water of crystallization and that its formula is either $C_{13}H_{16}O_{10}H_2O$ or $C_{13}H_{14}O_9 \cdot 2H_2O$. It is not hydrolysed by action of emulsin; it contains no aldehyde group, but does contain a phenol group.

The latter part of the paper deals with tannin from Turkish nutgalls. This tannin, purified by the chloroform-benzene-ether method described above, hydrolysed with normal sulphuric acid, yielded gallic acid and dextrose, but not much of the latter (as much as 20%) was decomposed during hydrolysis; hence the proportion of the two products of hydrolysis could not be determined. The optical rotation of tannin is $-\alpha]D + 28.6^\circ$ to $+31.8^\circ$; molecular weight estimations are reported and a comparison of the methyl compounds of the two tannins—Chinese and Turkish—is presented.—*Arch. d. Pharm.*, 250 (1912), No. 9, 668. (H. V. A.)

Tannin—Closely Related Synthetic Product.—E. Fischer and K. Freudenberg have prepared from glucose and gallic acid a substance closely related to tannin. Glucose was coupled with tricarbo-methoxygalloyl chloride by heating the substance in chloroform

solution with a little quinoline. By saponification with alkali the carbomethoxy group was removed, and a substance, probably

Pentaqalloylglucose, having tanning properties, was obtained. It is hoped that the constitution of tannin may be elucidated by means of this method of synthesis.—Pharm. Journ. and Pharmacist, Aug. 17, 1912, 233; from Ber. d. D. Chem. Ger. 45 (1912), 915.

Bismuth Tartrate in Scales—Advantageous Use in Making Bismuth Solutions.—Thomas D. Morson and J. Harpham point out the advantage, not to speak of the convenience, of using bismuth tartrate in scales for preparing the various bismuth solutions in vogue, such as Liquor Bismuth, Elixir, and Mixtures, and give formulas in which the salt is used in place of bismuth and ammonium citrate. They emphasize that liquor bismuthi et ammonii citras, being an alkaline solution, is incompatible with pepsin and other substances which are therapeutically active in an acid medium only. Also, if liquor bismuthi is dispensed with an alkaloidal solution, precipitation is liable to occur owing to the presence of free ammonia. With the substitution of liquor bismuthi tartratis for liquor bismuthi citratis, and having in mind that the former is slightly acid, the authors have successfully prepared a considerable number of elixirs, mixtures, and similar preparations, which show a distinct improvement in appearance and keeping qualities over the same mixtures prepared in the old way.

Bismuth Tartrate Scales, or soluble bismuth tartrate, is somewhat slowly soluble in cold and more readily soluble in hot water, forming a slightly acid solution. It is insoluble in alcohol. On incineration 50 per cent. of Bi_2O_3 is obtained. One hundred grains of the scales dissolved in water require 2 to 3 grains of sodium bicarbonate to produce a neutral solution. The method of preparing the salt is not given.—Chem. & Drugg., Dec. 28, 1912, 947.

Calcium Tartrate—Micro-chemical Test of Distinction from Calcium Oxalate.—See *Senna* under "Materia Medica."

"Thymotinic Acid."—Dr. C. Bachem describes a new aromatic acid derived from thymol which is chemically related to salicylic acid on the one hand and to thymol on the other. The new acid is called thymotinic acid and possesses strong antiseptic properties. It forms white crystals, is insoluble in cold water, slightly soluble in hot water, and soluble in acetic acid, alcohol, ether, chloroform and benzol. Thymotinic acid is supposed to have pronounced antirheumatic properties. The author also describes the acetone ester of the new acid,

"thymotinic acid aceton ester," a compound analogous to salicylic acid acetone ester (salacetol), to which the short name

"*Thymacetol*" is given. This is a white crystalline powder, insoluble in water, but readily soluble in the organic solvents, so among others in vegetable oils and fats. It melts at 75° , and is readily saponified even in the cold by ammonia or soda solution. Both thymotinic acid and thymacetol are relatively non-poisonous. Thymacetol, although possessing no antiseptic properties, has a pronounced local anesthetic action.—Pharm. Ztg., lvii (1912), No. 90, 905; from Berl. Klin. Wschr., 1912, No. 44.

ORGANIC BASES.

Organic Bases—A New Reaction.—Prof. Charitschkoff describes a new reaction for organic bases, which is obtained with a reagent composed of 1 volume of a solution of inactive naphthalic acid and $\frac{1}{2}$ volume of a 3 per cent. solution of cupric sulphate. On adding traces of aniline, pyridine or other organic bases to the mixture and shaking the colorless benzine layer assumes a green color. The reaction is probably of some value in forensic and biological examinations for alkaloid. Neither caffeine nor diphenylamine give the reaction, however.—Pharm. Ztg., lvii (1912), No. 47, 472; from Chem. Zt., 1912.

Alkaloids—Solubility in Basic Solvents.—M. Scholz calls attention to the fact that basic organic liquids, e. g., aniline, pyridine, piperidine and diethylamine, are excellent solvents for alkaloids and as such are excellent for "shaking out" in alkaloidal assays. The paper gives detail methods of solubility estimations and the author's conclusions as to the solubility of strychnine in water at 20° (1 part in 7163 parts to 1 part in 7255 parts) of strychnine in 10 per cent. ammonia (1 part in 3000 parts); of cinchonine in water at 20° (1 part in 7650 parts to 1 part in 7710 parts; cinchonine in 10 per cent. ammonia (1 part in 4000 parts); of strychnine in alcohol sp. gr. .832 at 20° (1 part in 119.5 to 1 part in 123 parts); of strychnine in 10 per cent. alcoholic ammonia (1 part in 390 parts) of cinchonine in alcohol sp. gr. 0.832 at 20° (1 part in 116) and of cinchonine in 10 per cent. alcoholic ammonia (1 part in 240 parts). He explained the fact that while aqueous ammonia is a better solvent for these two alkaloids than is water, alcoholic ammonia is not as good a solvent as is alcohol, by saying that as solvents for these, water is the poorest, ammonium-hydrozide is better and alcohol is best and that therefore the addition of ammonia to water adds solubility, while its addition to alcohol hinders solubility. The paper closes

with a table showing solubility of alkaloids in aniline, pyridine, piperidine and diethylamine.—Arch. d. Pharm., 250 (1912), No. 6, 418. (H. V. A.)

Alkaloids—Microchemical Identification.—Comprehensive investigation made by Dr. A. Grutterink convince him that many of the natural as well as synthetic alkaloids may be identified with accuracy, rapidity and reliability by microchemical methods, depending on the formation of characteristic crystallizations with certain organic acids. The author mentions an extensive series of acids which he has found exceedingly useful and believes that further study will determine other organic acids that will prove capable of forming characteristic crystalline compounds. Furthermore, the author has shown that potassium permanganate also supplies a valuable reagent for microchemical determinations, serving particularly well for the identification of hydrastinine, tropacocaine, and cotarnine.—Pharm. Ztg., lvii (1912), No. 21, 210; from Ztschr. f. analyt. Chem., 1912, 175-238.

Alkaloids—General Method for Their Determination in Drugs.—Felix Daels describes the following general method for the determination of alkaloids in drugs: To 10 Gm. of the dry powdered drug in a 400 Cc. flask add 200 Cc. of chloroform, followed by 50 Cc. of a 2 per cent. solution of NaOH. Weigh the flask and contents, boil half an hour under a reflux condenser, allow to cool, and restore the original weight with chloroform. Then filter off 150 Cc. of the chloroform solution through kieselguhr, shake the filtrate with 150 Cc. of acid solution of known titre, and filter (the acid solution ? Rep.) again through kieselguhr, collecting 100 Cc. This represents, in addition to the alkaloid from 5 Gm. of the powdered drug, a quantity of sodium hydroxide corresponding to 0.4 Cc. of a 1/10 N. NaOH solution, which must be included in the calculation. The acid solution is titrated with 1/10 N. NaOH solution, using hæmatoxylin as indicator, and the values found, after deducting 0.4 Cc. are calculated in the usual way. The author mentions some slight deviations from this general process which he has found expedient in the assay of several drugs: Cinchona, Ipecacuanha, Nux Vomica, Hyoscyamus, Aconite, and Belladonna.—Pharm. Ztg., lvii (1912), No. 75, 758; from Journ. de Pharm. d'Anvers., 1912, No. 14.

Alkaloids—Micro Chemical Identification.—E. B. Putt states that morphine, codeine, dionin, atropine, cocaine, b. eucaine, nicotine, antipyrin, strychnine, and heroin form characteristic crystals when

treated with either iodine, platinic chloride, or palladous chloride. Putt's method of procedure is to transfer by means of a teasing needle, a small fragment of the alkaloid to a perfectly clean glass slide, dissolve it in a drop of N/10 HCl, then add from a dropping bottle a drop of the appropriate reagent, then examine under microscope at once. Photomicrographs are given showing characteristic forms of crystals.—*Journ. Ind. and Eng. Chem.*, July, 1912, Vol. 4, p. 508. (L. A. B.)

Alkaloids—Extraction from and Determination in Syrups.—To extract alkaloids from syrupy liquids, E. Kohn-Abrest recommend that the liquid be well shaken with absolute alcohol and solid potassium carbonate. The alcohol is decanted, filtered, and distilled; the residue is redissolved in absolute alcohol, filtered, again evaporated, and dissolved in chloroform. The filtered chloroform solution is then evaporated, the final residue is converted into a salt solution in HCl.; the alkaloid hydrochloride so obtained representing the total alkaloid in the syrup.—*Chem. News*, March 8, 1912, 120; from *Bull. Soc. Chim. de France*, *xi-xii*, No. 2.

Alkaloids—Estimation in Syrups and Other Saccharine Liquids.—E. Kohn-Abrest says that when a hydroalcoholic solution of sugar is shaken with potassium carbonate, the salt, in dehydrating the alcohol, takes up the sugar, which settles to the bottom of the liquid when allowed to stand, while the alcohol, which is insoluble in concentrated aqueous solutions of potassium carbonate, separates and floats on the surface. The author makes use of this property thus: The sample to be tested is treated with four times its volume of absolute alcohol and about its own weight of potassium carbonate, the mixture shaken several times to take up as much of the salt as possible; after standing for about twelve hours, the sugar separates in a pasty state with the salt, while the supernatant alcohol contains the whole of the alkaloid in the free state. When the saccharine liquid to be tested is of low gravity (1.5 to 1.20), all traces of sugar disappear, but with stronger syrups (sp. gr. 1.30) it is preferable to use alcohol more or less diluted, instead of absolute alcohol. The specific gravity ought therefore to be ascertained to commence with. The alcoholic layer is decanted, filtered, and distilled; the residue obtained is taken up with a little absolute alcohol, filtered, and evaporated *de novo*. The residue is taken up with boiling chloroform, filtered, and evaporated. This final residue is converted into the salt by dissolving in hydrochloric acid, the solution evaporated to dryness to obtain the crystalline hydrochloride. The hydrochlorides thus obtained are very pure, and correspond to the whole of the alka-

loid originally present in the syrupy liquid.—Pharm. Journ. and Pharmacist, May 11, 1912, 607; from Am. Chim. Analyt., March 15, 1912, 85.

Angustura Alkaloids—Characters.—Troeger and Kroseberg continue the work on this subject which has occupied the attention of the former and his students for several years past. After reviewing this prior work and discussing methods of isolation of the two principal alkaloids of the bark—cusparin and galipin—and the separation of these two by formation of the easily crystallizable cusparin oxalate, the paper deals with behavior of galipin with special reference to its structural formula.

Troeger has already shown that galipin on oxidation with dichromate-sulphuric acid mixture splits into veratric acid, anisic acid, C_8H_9N and a nitrogenous acid which was yielded in too small amount by above method to permit careful study. Treatment of galipin with nitric acid of various concentrations gave nitro bodies rather than decomposition by oxidation and this nitro body was not broken up when treated even with dichromate-sulphuric acid mixture. On cautious oxidation with permanganate galipin split into veratric acid $C_6H_3(OCH_3)_2COOH$ and oxymethylquinoline carbonic acid $CH_3O C_9H_5NCOOH$, thereby suggesting as rational formula of the alkaloid, $CH_3OC_9H_5NCH_2CH_2C_6H_3(OCH_3)_2$.

In course of the investigation the following substances were obtained.

1. Nitrogalipin $C_{20}H_{20}NO_3NO_2$, yellow needles, m. p. 140° .
2. Its nitrate $C_{20}H_{20}N_2O_5HNO_3$, yellow crystals, m. p. 180° .
3. Its hydrochlorate $2C_{20}H_{20}N_2O_5HCl + H_2O$, yellow capillary crystals m. p. 180° .
4. Its sulphate $(C_{20}H_{20}N_2O_5)_2 H_2SO_4 + H_2O$, yellow needles m. p. $189-191^\circ$.
5. Platinum double salt $(C_{20}H_{20}N_2O_5)_2 2HCl Pt Cl_4$, orange yellow needles decomposing at 227° without melting.
6. Gold salt $C_{20}H_{20}N_2O_5HCl Au Cl_3$, golden needles, m. p. $190-192^\circ$.
7. An amido compound (by reduction of galipin with stannous chloride and HCl), gray white needles, m. p. 156° , yield too small to permit analysis.
8. The products of oxidation with permanganate (a) veratric acid, m. p. $179-180^\circ$, (b) the nitrogenous acid $C_{11}H_9NO_3$. This acid is monobasic, contains a methoxyl group and is presumably

methoxy-quinoline-carbonic acid, as is indicated by the fact that distillation of galipin with zinc dust yields quinoline.

From this *nitrogenous acid* was prepared

9. The crystalline acid containing 2 molecules of water,

10. Its platinum salt, orange red needles, m. p. 222°,

11. An oxyacid $C_{10}H_{11}NO_3$ obtained as side product in the Zeisel methoxyl estimation as fine thin needles turning brown at 261° and melting at 263°, presumably an oxyquinoline carbonic acid $H(O-C_9H_5N-COOH)$.

12. The platinum salt of methoxy-quinoline obtained in very minute quantities by heating "11" to 190°, distilling with steam and treating distillate with platinic chloride.

13. A crystalline nitrogenous acid (m. p. 263-264°) obtained by oxidation of the methoxy acid with dichromate-sulphuric acid mixture, but with yield too small to permit analysis.

The paper closes with graphic formula of galipin based on the reactions given above and with the statement that galipin when perfectly pure yields colorless salts.—Arch. d. Pharm., 250 (1912), No. 7, 494. (H. V. A.)

Antipyrine—Derivatives.—Mannich and Krösche call attention to the fact that the already observed precipitate occurring when antipyrine solution is mixed with formaldehyde and ammonia (or with hexamethylene-amine) is a distinct combination of the three substances having the formula $C_{39}H_{39}O_3N_7$. The same substance is obtained when antipyrine, formaldehyde and ammonium chloride are mixed, but when antipyrine, formaldehyde and hydrochloric acid are combined there is produced methylene bis-antipyrine, $C_{23}H_{24}O_2N_4$ which also results along with formaldehyde and ammonium chloride when the hexamethylene-antipyrine body $C_{39}H_{39}O_3N_7$ is heated with hydrochloric acid.

This decomposition reaction suggests that the new base is either a derivative of the bis-antipyrine body or that the hydrolysis first produces antipyrine and formaldehyde and that these two substances then react to produce the bis-antipyrine body and that the latter is true is shown by the fact that the bis-antipyrine body does not form if the hydrolysis is accomplished in the presence of something—example, sulphurous oxide—which will combine with the formaldehyde the moment it is liberated.

The hexamethylene-antipyrine body is shown to be tris-antipyril-tris-methylene-amine $(C_{11}H_{11}N_2O-CH_2)_3N$ and similar condensation products can be made, as shown below, from antipyrine derivatives and analogues. The combinations, because of their slight solubility,

are of but slight therapeutic value and by reason of possible formation of these bases under influence of the hydrochloric acid of the gastric juice, antipyrine and hexamethylene-amine should not be prescribed together.

The following bodies were prepared during the investigation:

1. *Tris-antipyril-tris-methylene-amine*. Small crystals, m. p. 259-260°.

2. *Hydrochlorate of same*. White crystalline powder, m. p. 178°.

3. *Methylene-bis-antipyrine*. $C_{23}H_{24}O_2N_4$, melting (when dried) at 179°.

4. *Bi-hydrochlorate of same*. Small crystals, m. p. 120-125°; when free from water, a crystalline powder, m. p. 200-220°.

5. *Monohydrochlorate of same*. Large soft crystals, m. p. 94-95°; when free from water, m. p. 100-110°.

6. *Tris - tolypyryl - tris - methylene-amine*, $(C_{12}H_{13}N_2-O-CH_2)_3N$. Small crystals, m. p. 214-215°.

7. *Hydrochlorate of same*. Short white crystals, m. p. 100-105° when air dried; 191° when completely dried over sulphuric acid.

8. *Methylene-bis-tolypyrine*, $C_{25}H_{28}O_2N_2$, obtained along with formaldehyde and ammonium chloride, when "7" is hydrolysed with 5% HCl. Fine white matted crystals (m. p. 190° when completely dry), which were also prepared by action of formaldehyde on tolypyrine.

9. *Tris - homo - antipyrine - tris-methylene-amine*. $(C_{12}H_{13}N_2-O-CH_2)_3N$, obtained by treating homo-antipyrine with hexamethylene tetramine in the presence of hydrochloric acid and then making mixture alkaline. Small white shining crystals melting at 280°.

10. *Hydrochlorate of same*. Fine hygroscopic crystals, melting at 202°.

11. *Methylene-bis-homo-antipyrine*. $C_{25}H_{28}O_2N_4$, obtained along with formaldehyde and ammonium chloride when "9" is hydrolysed with 5% HCl. Combines with one molecule of water, forming small crystals, melting at 120-130°, and when completely dry it melts at 105-106°.

12. *Bi-hydrochlorate of same*. White loose crystal masses, m. p. 200-210°. (H. V. A.)

Apomorphine—Preservative for its solutions.—Dr. U. Corbell's recommends the addition of hypophosphorous acid to render hypodermic solutions of apomorphine stable. Experiments have shown that this addition prevented an appreciable change in such solutions during an entire year; it remained clear and had acquired at most a faint yellowish tint, while the acid itself does not act unfavorably

on the apomorphine.—Pharm. Ztg., lvii (1912), No. 37, 373; from Bull. Chemic. Farmac.

Atropine—Use of.—Mosenthal, Herman O., reports some observations on atropine therapy in diabetes mellitus and concludes that he could observe no indication that atropine sulphate effects any change in the carbohydrate tolerance of sufficient importance to make the drug of clinical value in the treatment of this disease.—J. Am. M. Assoc., 1912, v 58, pp. 777-778. (M. I. W.)

Atropine—Distinctive Action of Emulsion of Some Animal Tissues upon it.—Dr. A. J. Clark has found that emulsion of certain organs of some animals (prepared with physiological salt solution) have the power of destroying atropine. The livers of the frog and rabbit possess this power and retain it after all the living cells have been destroyed. This distinctive action is due to a soluble substance resembling a ferment in its action. Frog liver has this power very markedly; the heart and kidneys of the same animal, only slightly; no other frog tissues have this power. Rabbit liver also acts strongly; the blood has less power, and no other rabbit tissue has any action on atropine. None of the tissues investigated of the cat, the rat, or the dog have any power to destroy atropine.—Pharm. Journ. and Pharmacist, Nov. 9, 1912, 581; from Brit. Med. Journ., 1912, 2, 1099.

Atropine Sulphate—Question of Water of Hydration.—D. B. Dott observes that atropine sulphate is referred to in the B. P. as well as other books as being an anhydrous salt; but a salt may be capable of forming a hydrate and yet be anhydrous in the condition in which it is usually prepared and sold. Absence of water from a potentially hydrated salt may occur from the drying of a readily efflorescent salt, or because of the menstruum from which the salt has been crystallized containing no water, or an insufficiency of water. The case of atropine sulphate is complicated by the fact that the compound is liable to contain a proportion of hyoscyamine sulphate, which admittedly has the formula $B_2H_2SO_4 \cdot 2H_2O$. Some base which had been prepared from belladonna root, having been twice precipitated by ammonia, was converted into sulphate and crystallized, the air-dry crystals being moistened with water and allowed to dry slowly at ordinary temperature. The loss of weight in water-bath was 4.29 per cent. $(C_{17}H_{23}NO_3)_2 \cdot H_2SO_4 \cdot 2H_2O$ requires 4.92. Some of the ordinary commercial sulphate, when dried in water-bath, lost 0.88 per cent. When moistened with water and allowed to dry thoroughly in the air, the loss of weight in water-bath was 1.98 per cent. These

results are quite consistent with the view that atropine sulphate crystallizes without water of crystallization, and the hyoscyamine salt with two molecules. But they show, at the same time, that the hyoscyamine is by no means so readily converted into atropine as is sometimes stated; and that the commercial sulphate of atropine does contain an appreciable amount of water, corresponding to fully $\frac{1}{4}\text{H}_2\text{O}$, and readily takes up water corresponding to $\frac{1}{2}\text{H}_2\text{O}$. It is admittedly difficult to prepare the salt without a moderate proportion of hyoscyamine sulphate, so that probably a percentage loss in water-bath of 1 to 1.3 should be permitted. The subject obviously requires further investigation.—*Pharm. Journ. and Pharmacist*, March 30, 1912, 425.

Benzylamine—Derivatives.—Mannich and Kuphal made several attempts to perform synthesis of iso-quinoline bodies from benzylamine compounds. While these efforts were fruitless, the following benzylamine bodies were obtained.

1. Oxethyl-benzyl-methylamine $\text{C}_6\text{H}_5\text{CH}_2\text{N}(\text{CH}_3)\text{CH}_2\text{CH}_2\text{OH}$ from benzylmethylamine and ethylene chlorhydrine. Colorless oil b. p. 133-135° at 14 Mm.

2. Hydrochlorate of same, but only in impure crystals.

3. Platinum double salt of same, $\text{C}_{20}\text{H}_{32}\text{O}_2\text{N}_2\text{PtCl}_6$, m. p. 173°.

4. Benzylvinyl-methylamine $\text{C}_6\text{H}_5\text{CH}_2\text{N}(\text{CH}_3)\text{CH}=\text{CH}_2$ from treatment of "1" with P_2O_5 . Oily liquid, b. p. 110-165° in vacuo.

5. Hydrochlorate of same, handsome white needles, m. p. 218-220°.

6. Platinum double salt of same, $\text{C}_{20}\text{H}_{28}\text{N}_2\text{PtCl}_6$, orange red needles, m. p. 215-216°.

7. Oxethyl-3, 4-methylene-dioxy-benzylamine, $\text{H}_2\text{C} \begin{array}{c} \diagup \text{O} \diagdown \\ \diagdown \text{O} \diagup \end{array} \text{C}_6\text{H}_3$

$\text{CH}_2\text{NHCH}_2\text{CH}_2\text{OH}$ from methylene-dioxy-benzylamine and ethylene chlorhydrine, b. p. 198-205° at 14 Mm.

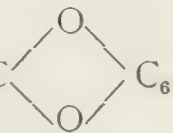
8. Hydrochlorate of same, $\text{C}_{10}\text{H}_{13}\text{O}_3\text{NHCl}$, white scales, m. p. 150-151°.

9. 3, 4-Methylene-dioxy-benzyl amido acetal, $\text{CH}_2 \begin{array}{c} \diagup \text{O} \diagdown \\ \diagdown \text{O} \diagup \end{array} \text{C}_6\text{H}_3$

$\text{CH}_2\text{NHCH}(\text{OC}_2\text{H}_5)_2$, from 3, 4-methylene-dioxy-benzylamine and chloracetal, colorless liquid, b. p. 197-202° at 12 Mm.


10. Hydrochlorate of same, $\text{C}_{14}\text{H}_{21}\text{O}_4\text{N HCl}$, m. p. 160° with decomposition.

11. Dichloracet-benzylamide $C_6H_5CH_2NHCOCHCl_2$ from benzylamine and dichloracetic ester, white crystals, m. p. $95-96^\circ$.

12. Dichloracet-3, 4-methylene-dioxy-benzylamide, H_2C  C_6H_5

$H_3-CH_2-NH-CO-CHCl_2$ from 3, 4-methylene-dioxy-benzylamine and dichloracetic ester, white needles, m. p. $136-137^\circ$.

13. Dichloracet-benzyl-methylamide, $C_6H_5CH_2N(CH_3)COCHCl_2$ from benzyl-methylamine and dichloracetic ester, fine white needles, m. p. 63° .

14. 3,4-methylene-dioxy-benzylamine and oxamethane- H_2C  $C_6H_5CH_2NH-CO-CO-NH_2$, small scales, m. p. $205-206^\circ$.

15. Benzyl-methylamine and oxamethane, $C_6H_5CH_2N(CH_3)CO-CO-NH_2$, white crystals, m. p. $86-87^\circ$.—Arch. d. Pharm., 250 (1912), No. 7, 539. (H. V. A.)

French Caffeine—Contamination with Traces of Copper and Probable Source.—P. Lemaire, having observed that a 1:10 aqueous solution of caffeine, dissolved by means of sodium benzoate, had, in the course of several months, deposited a bluish green crystalline mass, the nature of this was investigated. It was found to be a copper compound. The source of the impurity was traced to the caffeine employed. This was found to contain a minute but very distinct trace of copper. The contamination might, as usual in such cases, be attributed to the use of copper vessels, or might also be due to copper sulphate and lime used by the regulations of the French Customs to de-nature tea intended for the manufacture of caffeine. The amount of copper present is not considered to be sufficient to be harmful.—Pharm. Journ., March 16, 1912, 353; from Repertoire, 24 (1912), 49.

Carpiline—A New Alkaloid from Pilocarpus Microphyllus.—E. Léger and F. Rouques describe a new base, carpiline, $C_{16}H_{18}N_2O_3$, which they have obtained from the mother liquors of the nitrates and hydrochlorides of the total alkaloids of *Pilocarpus microphyllus*. When purified by crystallization from alcohol, it forms handsome colorless anhydrous prisms, melting at $184^\circ-185^\circ$ C. (corr.). It is a feeble base, alkaline to red litmus, but not to phenolphthaleine, but forming stable salts with the mineral acids—the nitrate, hydrobromide, and oxalate being amorphous, the hydrochloride and sul-

plate crystallizing well from alcohol, and all of them extremely soluble in water. The free base is soluble in chloroform, and in benzol, but only sparingly soluble in ether. Carpine is a mono-acid base, so that only one of its two atoms of nitrogen has a basic function. It resembles pilocarpine in its lactonic function, forming compounds with the alkalies. The physiological action of carpine is being investigated; it appears to be very slightly, if at all toxic, and has no action on the secretions in any way analagous to pilocarpine.—Pharm. Journ. and Pharmacist, Dec. 14, 1912, 749; from Compt. rend., 155 (1912), 1088.

Cinchotoxine and Quinotoxine—Production from Cinchonine and Quinine, and the Relation of This Conversion to the Toxicity of the Cinchona Alkaloids.—H. C. Biddle, of the University of California, points out that the abnormal action of quinine or cinchonine as occasionally observed and usually ascribed to some idiosyncrasy of the patient, may be due to the formation in the system of small quantities of cinchotoxine and quinotoxine, and has made a study of the conditions under which cinchonine and quinine are converted into their poisonous isomers.

He finds that when salts of cinchonine or quinine are heated with water, with or without excess of acid, at 98°-102° C. they give rise to varying quantities of their poisonous isomers, cinchotoxine or quinotoxine.

The velocity of the rearrangement rises as the dissociation constant of the acid falls, the change being practically quantitative with such acids as acetic, lactic, citric, tartaric, malic, etc., while on the other hand with such acids as hydrochloric, being hardly detectable, even after 48 hours heating.

The same changes take place at 36° C., the only difference from that observed at 98°-102° C. being the diminished rate of conversion, about 2 per cent. conversion being observed with the organic acids at this temperature. Sunlight has the property of producing similar changes at ordinary temperature, in solutions of cinchonine or quinine.—Jour. Am. Chem. Soc., April, 1912, Vol. 34, p. 500. (L. A. B.)

Cocaine — Differentiation of Substitutes.—D. Scherbatschew places three separate drops of the suspected solution on a glass slide and adds one drop, respectively, of the following reagents: 10 per cent. solution of NH_3 , 10 per cent. solution of KOH and saturated solution of NaHCO_3 . *Stovaine* and *Holocaine* give precipitates with all three reagents. *Beta-Eucaine* only gave a slight precipitate

with KOH and none with the other two reagents. *Nirvanine* forms a precipitate with NH_3 , only a slight one with KOH and none with NaHCO_3 . *Alypine* precipitates with NH_3 and KOH, but not with NaHCO_3 . *Novocaine* is precipitated by KOH but not by the other two reagents. *Cocaine* and *Tropacocaine* can be identified by Hankin's KMnO_4 test.—Ph. Journ., 1912, 567. (O. R.)

Codeine Phosphate—Contamination with Calomel.—During an examination of codeine phosphate, representing a large consignment, Hackenberg found the salt to leave a considerable insoluble residue when making the aqueous solution. On nearer examination this proved to consist of *calomel*, which was present in the amount of 2.96 per cent., but whether its presence was intentional or accidental is not known.—Pharm. Ztg., lvii (1912), No. 52, 521.

E. Wollenschlaeger, referring to the above mentioned contamination of codeine phosphate, observes that in 1909 he had (on two occasions ? Rep.) observed a contamination of this salt with calomel. The phosphate was purchased from a reliable firm and returned intact after ascertaining the presence of the mercurous salt. No attempt was made to determine the percentage of impurity.—Pharm. Ztg., lvii (1912), No. 54, 544.

Colchicine—Reactions.—According to C. Reichard's investigations, colchicine is an alkaloid possessing but feeble reactionary properties. It is, however, distinguished from the preponderating majority of alkaloids, independent of its distinctive color, that it is capable of crystallizing from its chloroformic solution in chemical combination with its solvent, and that its behavior towards reducing agents of all kinds is perfectly negative. An extremely characteristic property is the formation of a lemon-yellow solution in concentrated sulphuric acid, which is permanent on dilution with water, and the peculiar odor reminding of honey and wax which is manifested when even very small quantities are used. Colchicine is further identified by its behavior to nickel sulphate, and particularly to the rainbow-color display of a mixture of colchicine, water, and mercuric chloride.—Pharm. Ztg., lvii (1912), No. 83, 837; from Südd. Apoth. Ztg., 1912, No. 73.

Corynanthine and Yohimbine—Isomerism.—The researches of Fourneau on corynanthine, the base obtained from pseudo-cinchona, lead him to the conclusion that this substance is an isomer of yohimbine. The two bases, as well as the acids derived from them, crystallise from dilute alcohol in the hydrated form, and from absolute alcohol without water of crystallization. The hydrated

crystals lose all their water only when heated strongly, and undergo partial decomposition at the same time. This behavior is the cause of the variation in the published analytical figures for yohimbine. This base, after repeated crystallization from absolute alcohol, melted at 244° , and on analysis was found to have the formula $C_{21}H_{26}O_3N_2$, which is the formula assigned to corynanthine. Determinations of the optical rotation of the hydrochlorides gave the following results: Yohimbine hydrochloride $[\alpha]^{27^{\circ}}_D = +105^{\circ}$; corynanthine hydrochloride, $[\alpha]^{20^{\circ}}_D = -60^{\circ}15'$. According to Hesse, quebrachine also has the formula $C_{21}H_{26}O_3N_2$. This substance is dextrorotatory, and is probably the optical isomer of corynanthine.—Pharm. Journ. and Pharmacist, March 16, 1912, 353; from Bull. Soc. Chim. de. France [4], 9, 1.037.

Creatinine and Its Oximes.—E. Schmidt, E. Thumann and W. Hennig publish three papers on this topic, as contributions toward solving the structure of creatinine, showing that contrary to the idea of Neubauer that when creatinine is acted on by an alkyl iodide, it acts as a tertiary base; in truth, in such reaction it acts as a secondary base. This they prove by the study of the two bodies obtained by the well-known Liebermann reaction based on behavior of secondary bases with nitrous acid, the two products turning out to be oximes, not nitroso compounds. In treating a cooled nitric acid solution of creatinin with sodium nitrite and then crystallizing, two types of crystals were obtained. These were separated by treatment with warm absolute alcohol, in which one body dissolved, while the other did not. The alcohol soluble body melted at 193° - 194° and was proven to be identical with methylhydantoinoxime, while the alcohol-insoluble portion which turned brown at 250° without fusing was creatinoxime, which is the body that Kramm prepared and called nitroso creatinin.

The experimental work on methylhydantoin is reported by Thumann, who gives details of preparation and physical data concerning it and its derivatives, the silver compound; the phenylhydrazone; a di-acetyl compound. Treating the oxime with hydrochloric acid yielded methylparabanic acid, from which was prepared a silver salt and a phenylhydrazide. Reaction with sodium amalgam gave methylparabanic acid, while the oxime on heating with barium hydroxide solution decomposed, breaking into ammonia, methylamine, carbon dioxide and oxalic acid. Oxidation with permanganate did not yield a guanidine derivative, but produced a nitrogenous product, which however, was obtained in too small quantities to furnish satisfactory analytical results. Since ammonia and methylamine

are produced it is evident that oxidation decomposes the oxime. Graphic formulæ of the several above described bodies are given in the original paper.

Creatinoxime, $C_4H_6N_4O_2$ was studied by Hennig, who prepared it by the Kramm method as white crystalline needles turning brown at 250° without melting. From it was prepared a silver compound, $C_4H_5N_4O_2Ag$, a hydrochloride, a gold double salt of same, $C_4H_6N_4O_2HCl + AuCl_3$; a platinum double salt and a diacetyl derivative $C_4H_4(C_2H_3O)_2N_4O_2$. On boiling with hydrochloric acid, the oxime splits into ammonium tetraoxalate, hydroxylamine, ammonia and methylamine, while reduction with hydrochloric acid and tin foil yielded methylguanidine and ammonia.

Lastly it is recorded that creatinin oxime on treatment with nitric acid (sp. gr. 1.146) is converted into methyl-hydantoin-oxime.—Arch. d. Pharm., 250 (1912), No. 5, 330, 351 and 370. (H. V. A.)

Damascenine—Synthetic Production.—A. J. Ewins has obtained damasceninic acid, a derivative of damascenine, which is a constituent of nigella oil, synthetically from *m*-hydroxybenzoic acid. Since Keller (1908) has shown that it is possible to convert damasceninic acid into *damascenine*, it follows that this alkaloid may be prepared synthetically by Ewins' method.—Schimmel's Rep., April, 1912, 96.

Ephedrine and Pseudoephedrin.—Ernst Schmidt reviews work done on these alkaloids by himself and his students and then takes up the unsuccessful attempts of Dr. Calliess under his direction to make an inactive form of these optically active alkaloids ephedrine hydrochloride $[a]^{20/D} - 35-36^\circ$; pseudo-ephedrine hydrochloride $[a]^{20/D} + 60^\circ$ to 62° . The work, however, brought out the following facts: (1) Ephedrine heated with barium hydroxide even to 210° C. was unaffected; pseudo-ephedrine heated with the same chemical to 180° C. was converted into ephedrine. (2) Ephedrin heated on water bath with a concentrated sulphuric acid is converted into pseudo-ephedrin; pseudo-ephedrin so treated was unaffected. This effect is also noted on dissolving either of the alkaloids in cold concentrated sulphuric acid. When immediate reading shows for either alkaloid (as sulphate) the same angle of rotation $+73.10$ to $+74.25^\circ$ which angle decreases on standing in same proportion for either alkaloid till after 72 hours standing the angle is $+34.10$ to $+34.96^\circ$. (3) Preparation of an acetyl preparation of either alkaloid gives same body, the hydrochloride of which has $[a]^{20/D}$ of $+96.7^\circ$ to $+96.8^\circ$, while the same agreement is shown in the melting points free acetyl derivatives in the chlorides and in the platinum and gold

double salts. (4) The acetyl combinations and the nitroso bodies were given careful chemical and optical study which is fully described in the original paper.—Arch. d. Pharm., 250 (1912), Nos. 2 and 3, 154 and 161. (H. V. A.)

Ergothioneine—Constitution.—By the researches of G. Barger and A. J. Ewins, ergothioneine, $C_9H_{15}O_2N_3S$, a crystalline base isolated from ergot by Tanret in 1909, has been found to be a betaine of thiolhistidine (α -amino- β -2-thiolglyoxaline-4 (or 5) propionic acid). On boiling with 50 per cent. aqueous potassium hydroxide trimethylamine is eliminated, and an acid, $C_6H_6O_2N_3S$ (β -2-thiolglyoxaline-4 (or 5) acylic acid), is obtained. On oxidation with dilute nitric acid the latter yields β -glyoxaline-4 (or 5) acrylic acid, from which on reduction β -glyoxaline-4 (or 5) propionic acid is produced. The treatment of ergothioneine with ferric chloride leads to the formation of histidine-betaine.—Pharm. Journ. and Pharmacist, Jan. 27, 1912, 97; from Proc. Chem. Soc., 27, 393-395.

Fagaramide—A Constituent of the Root-bark of Fagara Xanthoxyloides, Lam.—In conjunction with F. Thümen, Professor H. Thoms has isolated from the root-bark of *Fagara Xanthoxyloides*, Lam., an interesting amide, to which they give the name fagaramide. It was obtained by extracting the root-bark with benzene, concentrating and adding petroleum spirit, when the fagaramide crystallized out. It crystallises well from alcohol, has the empirical formula $C_{14}H_{17}NO_3$, and melts at 119° to 120° C. It yields a bromine compound of the formula $C_{14}H_{17}NO_3Br_2$, which crystallizes without decomposition from benzene and other hydrocarbons only, crystallization from alcohol resulting in the separation of bromine. By oxidation with potassium permanganate, fagaramide yields piperonal and piperonylic acid, and on prolonged boiling with 50 per cent. alcoholic potash decomposes into an unsaturated acid, which proved to be piperonylic acid and a base, volatile in a current of steam, which was identified as isobutylamine. From these products the conclusion was drawn that fagaramide was the isobutylamide of piperonylacrylic acid. The isobutylamide of piperonylacrylic acid belongs to the group of substituted acids, very few members of which have been found in nature. The one best known is piperine, the alkaloid of *Piper nigrum*.—Pharm. Journ. and Pharmacist, May 25, 1912, 686.

Methylated Guanidines—Properties.—M. Schenck continues his work on guanidine derivatives describing method of preparation and properties of the following compounds:

1, 1-Dimethylguanidine $\text{HN}=\text{C}(\text{NH}_2)\text{N}(\text{CH}_3)_2$; 1, 3-Dimethylguanidine $\text{CH}_3\text{N}=\text{C}(\text{NH}_2)\text{NHCH}_3$; 1, 1, 2-Trimethylguanidine $\text{NH}=\text{C}[\text{N}(\text{CH}_3)_2]\text{NHCH}_3$; 1, 1, 3-Trimethylguanidine $\text{CH}_3\text{N}=\text{C}(\text{NH}_2)\text{N}(\text{CH}_3)_2$; 1, 2, 3-Trimethylguanidine $\text{CH}_3\text{N}=\text{C}(\text{NHCH}_3)_2$ in the manufacture of which an intermediate product $\text{CH}_3\text{N}=\text{C}=\text{NCH}_3$ was encountered; 1, 1, 2, 2-Tetramethylguanidine, $\text{HN}=\text{C}[\text{N}(\text{CH}_3)_2]_2$; 1, 1, 2, 3-Tetramethylguanidine $\text{CH}_3\text{N}=\text{C}(\text{NHCH}_3)\text{N}(\text{CH}_3)_2$; and a Pentamethylguanidine $\text{CH}_3\text{N}=\text{C}[\text{N}(\text{CH}_3)_2]_2$. From these, gold and platinum salts and picrates were prepared and analyzed, and a table showing physical properties of each is given in the article.—Arch. d. Pharm., 250 (1912), Nos. 4 and 5, 306 and 321. (H. V. A.)

Heroin—Facts About.—An editorial (J. Am. Med. Assoc., 1912, v. 59, pp. 2262-2263), points out that although heroin and its hydrochlorides have been in use but a few years, they have already established themselves among the habit forming drugs and have become sufficiently conspicuous in this respect to awaken the thinking public to the deplorable results for which they may become responsible. (M. I. W.)

Heroin.—John Philips (J. Am. Med. Assoc., 1912, v. 59, pp. 2146-2147), discusses the prevalence of the heroin habit and expresses the opinion that this is largely due to the fact that pharmacologic text books lay very little stress on this point and in many cases neglect to mention it altogether. One of the patients treated by Philips was himself a physician who had been misled by the advertisements of proprietary medicines in medical journals. (M. I. W.)

Hexamethylenetetramine—Action of Hydrogen Dioxide on the Base and on its Salts.—C. V. Girsewald finds that when hexamethylenetetramine is dissolved in a small excess of 30 per cent. solution of hydrogen dioxide and is then concentrated *in vacuo*, a crystalline compound, readily soluble in water and in alcohol is produced, which is a "hexamethylenetetraminehydrogenperoxide," of the composition $(\text{CH}_2)_6\text{N}_4\cdot\text{H}_2\text{O}_2$ —the H_2O_2 having the function of an acid. If, on the other hand, the hydrogen peroxide is allowed to act on a salt of hexamethylenetetramine, the "hexamethylenetetramine-triperoxide-diamin," $(\text{CH}_2)_6\text{N}_2\text{O}_6$, previously obtained by Bayer and Villiger by other methods, is produced—Pharm. Ztg., lvii (1912), No. 99,999; from Ber. d. D. Chem. Ges. 45 (1912), 2571.

Hexamethylenamin.—Vanderhoof, Douglas, discusses the use of hexamethylenamin in the treatment of bronchitis. He recommends the drug as a remedy of value in cases of acute colds and in patients

suffering from acute and chronic bronchitis.—J. Am. M. Assoc., 1912, v. 58, pp. 331-332. (M. I. W.)

Hexamethylenamin.—Fullerton, William D., reports a case of medicinal cystitis following the administration of hexamethylenamin.—J. Am. M. Assoc., 1912, v. 58, pp. 78-80. (M. I. W.)

Hyoscine Hydrobromide—Commercial Variation.—Experiments reported to the Brit. Pharmaceutical Conference, 1912, by H. Finemore and Dorothy Braithwaite point to the necessity of pharmacists for care in the examination of their stock of hyoscine hydrobromide. An examination of six commercial samples showed that only four of them approximated in character to the pure laboratory compound.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1912, 498-500.

Dextrogyrate Lupanine—Extraction from Lupin Seed and Chemical Relations.—A. Beckel reports further work on dextro-lupanine as conducted by Professor Ernst Schmidt and his pupils. The paper gives table of yield of alkaloid by different methods of extraction from Lupin seed, followed by physical data relating to d-Lupanine $C_{15}H_{24}N_2O$ (m. p. 200°) and to oxy-lupanine $C_{15}H_{24}N_2O_2$ (m. p. $205-206^\circ$), both of which were obtained from the crude alkaloid. Oxidation of the d-lupanine with chromic acid mixture, with hydrogen dioxide, both 3% and 30%, and alkaline potassium permanganate was tried. The yield of oxidized product in the first two cases was too small for satisfactory examination, but the permanganate product gave a gold salt (m. p. $188-189^\circ$) and a platinum salt $(C_{15}H_{24}N_2O_3HCl)_2 \cdot PtCl_4 + 2H_2O$. With bromine either in aqueous, alcoholic or acetic acid solution, lupanin forms an orange red precipitate. This does not mean (as previous investigators have reported) a splitting of the lupanine, but the product consists of a mixture of the dihydrobromides of lupanine, of oxy-lupanine, and of ethoxy-lupanine. These, Beckel has been able to separate by fractional crystallization.

Ethoxy-lupanine dhydrobromide, $C_{15}H_{23}N_2O \cdot C_2H_5HBr$ melts between 228 and 236° and has optical index $\alpha_D - 129.4^\circ$.

Ethoxylupanine hydriodide prepared from the hydrobromide with hydriodic acid as needles melting at $221-222^\circ$.

Ethoxy-lupanine-di-sulphocyanate, $C_{15}H_{23}N_2O \cdot C_2H_5 \cdot 2HSCN$, by treating the hydrobromide with ammonium sulphocyanate colorless needles, m. p. $172-174^\circ$.

Ethoxy lupanin gold chloride, m. p. 145-150°, a crystalline combination of 2 molecules of the ethoxy-lupanin hydrochlorate with one and two molecules of AuCl_3 respectively.

A reduction product, prepared by treating the hydrobromate with hydriodic acid. This was a base whose iodo-methylate has same formula as the iodo-methylate of d-lupanine, $\text{C}_{15}\text{H}_{24}\text{N}_2\text{OCH}_3\text{I}$, and resembles it in all respects save in its gold and platinum salts.

The article closes with description of the other dehydrobromides mentioned above.—Arch. d. Pharm., 250 (1912), 691. (H. V. A.)

Lysidine (Methyl-Glyoxalidin)—*Preparation and Characters*.—K. Schuster says that lysidine, or methyl-glyoxalidine, is prepared as follows: One molecular weight of ethylene-diamine hydrochloride is subjected with two molecular weights of sodium acetate to dry distillation, and the fraction distilling between 190° and 220° is acidified with dilute hydrochloric acid and evaporated to dryness; the lysidine hydrochloride produced is then freed from ethylene-diamine hydrochloride by crystallization from alcohol, in which the latter is almost insoluble, and the free base is then obtained by adding potash to the hydrochloride and extracting with chloroform. Lysidine so obtained forms colorless crystals, easily soluble in water or alcohol, insoluble in ether; m. p., 105° to 106°; b. p., 195° to 198°. Being very hygroscopic, it appears commercially as a 50 per cent. solution. This is a syrupy liquid of slight characteristic odor, tasting at first sour, then bitter, and having a strong alkaline reaction. From this solution the non-hygroscopic

Acid Tartrate of Lysidine (Methyl-Glyoxaline Bitartrate) is obtained by adding excess of tartaric acid and evaporating to crystallization. It forms a white crystalline, odorless powder of acid taste, soluble in four parts of water, easily soluble in dilute acids or alkalies, less so in alcohol, almost insoluble in chloroform or ether. It melts at 193° to 194° without decomposition.—Pharm. Journ. and Pharmacist, Sept. 21, 1912, 371; from Ztschr. d. Allgem. Osterr. Apoth. Ver., June 29 and July 6, 1912, 313 and 327.

Morphine Sulphate—*Contamination with Codeine*.—During the course of an examination of some tablets of morphine and atropine sulphate, J. B. Williams found that the amount of alkaloid other than morphine greatly exceeded the amount of atropine supposed to be present. This led to the conclusion that some other alkaloid was present, and an extraction of tablets of morphine sulphate containing no atropine proved this to be the case, codeine being the other alkaloid found. Further examination showed that codeine is

apparently a constant contaminant of commercial morphine sulphate. Samples obtained from five large manufacturers of morphine sulphate were found to contain respectively, 0.9, 1.9, 2.2, 3.6, and 7.0 percent. of codeine, and five samples of morphine sulphate tablets made by leading pharmaceutical manufacturers contained 2.5, 2.5, 2.9, 3.1, and 6.5 per cent. respectively, of codeine calculated on their morphine content. The author accounts for the presence of codeine in the commercial morphine sulphate by the presence of the codeine in the aqueous opium extraction from which the morphine is precipitated by the process usually followed, and experiments made showed that it is not possible to completely separate codeine from morphine in this way. A method for determining the codeine in morphine sulphate is described in detail; it depends on the practical insolubility of morphine held in alkaline solution, when shaken out with chloroform, whereas the codeine is completely dissolved and remains as residue on evaporating the chloroform solution.—*Amer. Journ. Pharm.*, Sept., 1912, 391-393.

Morphine Assay—Criticism of the G. P. Method.—E. Anneler publishes a lengthy critique of the assay of German Pharmacopœia finding that its results, especially with the proprietary opiate in which he is interested are invariably low, being 4 to 5 per cent. less than the real morphine figure when a 50 per cent. morphine preparation is assayed. He reviews other suggested methods of assay, among them the process of the British Pharmacopœia of 1898, and then recommends the following method. An aqueous solution of the preparation containing morphine is made alkaline with sodium bicarbonate shaking out with a saturated solution of morphine chloroform, this removing all the alkaloids except morphine, which floats in the aqueous layer above the chloroform. The shaking out with saturated solution of morphine in chloroform is repeated twice, the chloroform layer in each case being passed through a small filter which will hold back what morphine may pass from the separatory funnel with the chloroform. After the chloroform has filtered, the funnel and filter paper are placed in the opening of the separatory funnel and a mixture of equal volumes of isobutyl alcohol and chloroform is passed through same into the funnel and the morphine is "shaken out" from the alkaline watery layer with this solvent, the shaking out being repeated twice. After evaporation of the solvent the morphine is dissolved in a known amount of hydrochloric acid and the mixture is then "titrated back," jodeosin being used as indicator.—*Arch. d. Pharm.*, 250 (1912), No. 3, 186. (H. V. A.)

Morphine—Determination in Tablets.—L. Henry Bernegau and Fritz Heidelberg say that “the determination of morphine with accuracy, even in plain tablets of morphine sulphate or hydrochloride, is not an easily accomplished assay. Morphine, being an exception to the rule that alkaloids are soluble in the ethereal solvents usually employed in assaying, precludes the use of the ordinary “shaking-out process.” They recommend the following process for the estimation of morphia in tablets:

An amount equal to about 0.3 grams morphine sulphate is dissolved in water or in 1 per cent. sulphuric acid, using as little water as possible. We preferably dissolve the tablets directly in the separator with from 10 to 15 Cc. of water; 50 Cc. amyl alcohol are added and the liquids in the separator are heated on a steam-bath. When hot enough, sufficient ammonia is added to make distinctly alkaline, using litmus paper as an indicator. Shake vigorously for ten minutes. Cool and draw off into a second separator. Wash out the amyl alcohol with 5 Cc. of water and add these to the first watery solution. Filter the amyl alcohol into a 250 Cc. Jena flask through a funnel with a cotton plug moistened with amyl alcohol. If the amyl alcohol is not absolutely clear it does not matter, as long as the above outlined precautions are observed. Rinse the remaining contents of the first separator into the second separator with 50 Cc. of amyl alcohol, heat again on water-bath and shake for ten minutes. Be sure that the liquids are sufficiently alkaline. After cooling and separating, repeat the shaking-out once more. The united amyl alcohol filtrates are then distilled in a paraffin bath to a small volume. The last few Cc. should be evaporated by inserting the flask in a large beaker containing boiling water. A bent glass tube is inserted into the flask in such a manner that it reaches nearly to the bottom, and the air is aspirated through the tube with a water-pump. In this way the last traces of amyl alcohol together with the ammonia liable to be present can be evaporated in a very short time. It is better to take the morphine out of the paraffin bath too soon rather than too late as too long drying in the paraffin bath decomposes the morphine. The recovered amyl alcohol may be used over and over again.

After drying the morphine, about 12 Cc. 10/N sulphuric acid and 20 Cc. pure chloroform are added and heated on a water bath until solution of the morphine is effected and the chloroform driven off. Should some of the morphine have escaped solution, add more chloroform. Cool, add a few drops of cochineal T. S. and titrate back the excess of 10/N sulphuric acid. Calculate the amount of

morphine: 1 Cc. 10% $\text{N H}_2\text{SO}_4$ = 0.0376 gram morphine sulphate. An accuracy to within 0.5 per cent. to 1 per cent. of the theoretical can readily be obtained by rigidly adhering to this procedure.—Proc. Penn. Pharm. Assoc., 1912, pp. 306-307. (E. C. M.)

Nicotine—Amount in the Tobacco Plant.—Chuard and Mellet report an investigation of the nicotine content of tobacco from the sprout in early spring to the defoliated plant in the fall. The results were as follows, the nicotine being expressed in parts per thousand: 1. Sprouts three weeks old, traces of nicotine in entire sprout. 2. Young plants seven weeks old (after "*repiquinage*") leaves 0.324; roots 0.234. 3. Plants ten weeks old (before topping), leaves 0.447; stems 0.081; roots 1.085. 4. The cut apex from plant ten weeks old, 0.687. 5. The topped plant thirteen weeks old (at beginning of development of "*repousse axillaires*") leaves 4.989; stems 0.933; root 2.890; small "*repousses*" 1.490; large "*repousses*" 1.970. 6. Plants 19 weeks old (just at withering of leaves), leaves 9.202; stems 0.868; roots 2.669; "*repousses*" 1.568. 7. Withered stalk (after decay of leaves), stems 0.972; roots 1.987; "*repousses*" 1.283. The above figures refer to the fresh plant and the paper gives another table showing percentage of nicotine in each of the above samples when dried.—Schweiz. Wschr. f. Chem. u. Pharm. 1 (1912) No. 31, 470. (H. V. A.)

Nicotine—Estimation in Tobacco.—In an article on "The Toxic Factor in Tobacco" in the "Lancet" (April 6, 1912), the author, questioning the reliability of the methods hitherto used for estimating the amount of nicotine in tobacco, proceeds to describe a method which he evidently regards as being satisfactory and better than other published methods. The opinion is expressed that "the chief obstacle against arriving at the true amount of nicotine in tobacco has been due to the difficulty of separating ammoniacal compounds from the alkaloidal base"; and the method recommended is the precipitation of the nicotine from solution by adding excess of iodine, dissolving the periodide (after washing) in acetone, and titrating with thiosulphate. The calculation is based on one molecule of nicotine combining with four of iodine.

E. F. Harrison and P. A. W. Self, commenting on the above, observe that while not dissenting in any way from the view that most or all of the published methods are by no means trustworthy, or satisfactory, they are compelled to regard the method given by the *Lancet* chemist as being quite as unsatisfactory as most of the others. They give their reasons for this view, supported by experimental data, and describe a simple method to which they have

been led in the course of some years experience in the determination of nicotine in tobacco, which they have found to give reliable results. This method consists in the addition of alkali to the tobacco or preparation of nicotine (slaked lime being used in the case of tobacco), and then to distil in a current of steam until all the nicotine has passed over, as shown by a few drops giving no cloudiness when treated with acid and excess of iodine. The distillate is received in a measured excess of standard acid, the delivery-tube of the condenser dipping below the surface so that no loss can occur; when all the nicotine is over, the distillate is titrated with standard alkali, using litmus solution or tincture of cochineal as indicator, and from the amount of acid neutralized by the distillate the total volatile alkali, consisting of nicotine and ammonia, is found. A further 10 Cc. of normal acid is then added and the liquid evaporated to about 50 Cc. It is possible to lose traces of nicotine during the evaporation, but when once the total volatile alkali has been determined loss of nicotine is of no consequence, and loss of ammonia cannot occur. The nicotine is then completely precipitated by iodine, and the ammonia determined in the liquid by adding thiosulphate and distilling with alkali. The working details are given, but must be consulted in the original, in *Pharm. Journ. and Pharmacist*, June 1, 1912, 718-719.

Nor-Hyoscyamine and Nor-Atropine.—*New Solanaceous Alkaloids*.—F. H. Carr and W. C. Reynolds announce the discovery of two new alkaloids obtainable from solanaceous plants, namely, nor-hyoscyamine and nor-atropine, which have hitherto eluded researchers, but the chemical identity of which is established by ample proofs of their constitution.

Nor-hyoscyamine ($C_{16}H_{21}NO_3$) differ from hyoscyamine ($C_{17}H_{23}NO_3$) only in that the methyl group, CH_3 , is replaced by an atom of hydrogen. It was first isolated from *Scopolia japonica*, but has since been obtained from *Datura metel*, *Datura meteloides* and *Duboisia myoporoides*. It also occurs in *Datura fastuosa* and *Mandragora vernalis*, and probably in other solanaceous plants. Nor-hyoscyamine is crystalline, melts at $140^\circ C.$, and forms well crystallized salts. Its specific rotation is -23° , while that of the basic ion contained in its salts is -33.8° . The ratio between these two figures is 1:1.47, which agrees with that of hyoscyamine. As regards

Nor-atropine, just as hyoscyamine is converted by the action of alkalies to its racemic modification atropine, so by the same treatment nor-hyoscyamine is converted into its racemic modification nor-

atropine. Nor-atropine melts at 113° C. and forms a hydrate melting at 73° . By the action of methyl iodide upon it atropine was synthesized, thus proving its relationship to the latter. Subjected to physiological tests, by Dr. Laidlaw of the Wellcome Physiological Research Laboratories, the two new alkaloids were found to have about one-eighth the mydriatic effect of the corresponding hyoscyamine and of atropine respectively. Finally, it may be mentioned that the

Pseudo-hyoscyamine, isolated by E. Merck from *Dubosia myoporoides*, is considered by the author to be nor-hyoscyamine contaminated with a little hyoscyamine.—Chem. and Drug., May 11, 1912, 700.

Phenolphthalein—Influence of Alcohol and Some Neutral Salts on End-Reactions.—E. Lenk and J. Monschein find that if ammonium chloride is added to a weak alkaline solution containing phenolphthalein, the red color disappears, and more alkali must be added to restore it; the amount of alkali necessary increases in proportion to the amount of water present. If, however, alcohol is added, much more alkali will be necessary, as more alcohol or water is added, the effect of the latter is seen to be greater to an increasing extent. In some of the cases recorded the amount of alkali required was thirty times as much when alcohol was added as when an equal volume of water was employed. Ammonium chloride may be replaced by magnesium sulphate or some other salts.—Pharm. Journ. and Pharmacist, July 6, 1912, 7; from Chem. Ztg., May 11, 1912, 534.

Physostigmine—Derivatives.—It has been shown by Ehrenberg that when physostigmine is heated with alkalies in the absence of air, a new base is formed in addition to carbon dioxide and methylamine. This new base, designated *Eseroline*, has been the subject of investigation by Dr. A. H. Salway in order to gain further information regarding the constitution of physostigmine. Eseroline was found to be a mono-acidic tertiary base, which contains one nitrogen atom attached to a methyl group. It yields a hydrochloride, $C_{11}H_{15}ON_2HCl$, melting at 212° C., and a picrate melting at 195° C. The oxidation products of eseroline are:

Rubreserine, $C_{13}H_{16}O_2N_2$, a fine deep-red crystalline compound, formed when eseroline was allowed to absorb two atoms of oxygen in the presence of alkali. It is a neutral substance, which, however, yields salts with both acids and bases. The hydrochloride, aurichloride, picrate, and silver salt of rubreserine were described.

Cæruleserine.—The so-called "Eserine Blue," obtained by the slow oxidation of physostigmine, was isolated for the first time in a pure condition, and designated *cæruleserine*. It dissolves in water, giving, even in dilute solutions, an intensely blue color. Acid solutions of *cæruleserine* are dichroic, being blue by transmitted light and carmine-red by reflected light. *Cæruleserine* has the formula $C_{17}H_{23}O_2N_3$, and yields salts with two equivalents of acid. Its formation is undoubtedly due to condensation of the degradation products of the alkaloid.—Chem. and Drug., May 11, 1912, 700.

Pilocarpine—*Detection in Presence of Quinine*.—M. G. Meillère takes advantage of the solubility of quinine chromate and insolubility of pilocarpine chromate in chloroform, for the detection of pilocarpine in ointments, hair-dressings, etc., containing both alkaloids. The faintly acidulated solution of alkaloids is treated with potassium dichromate as long as a precipitate forms, and then extracted with chloroform as long as this becomes colored. On the addition of chloroform and oxygenated water (= Solution of Hydrogen Dioxide) to the residual liquid, the characteristic color reaction of pilocarpine manifests itself if present. The quinine is detected in the chloroform solution after eliminating the chromic acid with ammonia.—Phar. Ztg., lvii (1912), No. 72, 727; from Journ. de Pharm. et Chim., 1912, No. 3.

Propiophenone—*Derivatives*.—Dr. Calliess, endeavoring the synthesis of the alkaloids ephedrine and pseudo-ephedrine, both of which have the formula $C_6H_5-CH-CH-CH_3$ chose as the most likely



starting substance propiophenone $C_6H_5CO-CH_2-CH_3$. From this he prepared (1) amido-propiophenone $C_6H_5CO-CH(NH_2)-CH_3$ as well as its hydrochloride, nitrate, picrate and its double salts with platinum, gold, mercury and tin; (2) o-amido-propiophenylcarbinol (or amido-ethyl-phenyl-carbinol) $C_6H_5CHOH-CH(NH_2)CH_3$ and its hydrochloride and its double salts of platinum and gold; and (3) methylated combination of "2," such as the gold and platinum double salts of $C_6H_5CHOH-C_2H_4N(CH_3)_3Cl$. For manufacture and properties the original paper should be consulted.—Arch. d. Pharm., 250 (1912), No. 2, 141. (H. V. A.)

Protopine and Kryptopine—*Structural Study on Comparison*.—P. W. Danckwortt publishes a long and important article on these two alkaloids of opium, with especial reference to the structure of protopin, which he considers (as does E. Schmidt) as the alkaloid upon whose structure all other papaveraceous alkaloids are based.

After a review of the history of protopine and after emphasizing its wide-spread occurrence—albeit in small quantities—the plants of the Papaveraceæ and its sub-family the Fumarinaceæ, he reports his own work with the alkaloid which he extracted chiefly from *Dicentra spectabilis*. He reports on the physical properties of protopine, its color reactions and on the best method of extraction. He then shows by experimental work that from its empiric formula $C_{20}H_{19}NO_5$ the following points of its structural formula can be deduced.

1. The nitrogen atom has a methyl group attached to it.
2. This nitrogen atom is in an isoquinoline group and when the alkaloid is treated in active solution with methyl iodide, the pyridine ring of the isoquinoline splits, forming protopine-iodo-methylate.
3. The alkaloid contains neither a phenol group nor an alcoholic OH group, nor a methoxyl group.
4. It is certain that two of the five oxygen atoms are in a methylene-oxy-group and it is most likely that four oxygen atoms are so found.
5. Nine carbon atoms are in the isoquinoline group, six are in a separate benzene ring, one is in a methylene-oxy-group on the isoquinoline ring; one in a similar group attached to the benzene ring; one is in a methyl group attached to the nitrogen; one is a methyl attached to the benzene ring; while the 20th is a carbon "bridge" connecting the benzene ring to the iso-quinoline.
6. The fifth oxygen is attached to the "bridge" carbon just mentioned constituting a ketone group.
7. The above grouping of the carbon, nitrogen and hydrogen atoms accounts for all 19 of the hydrogen atoms.

Reference must be made to the original paper for proofs of structure cited above, as deduced by the author, partly by comparison with structure of other papaveraceæ alkaloids and partly by experimental work during which the following compounds were prepared:

1. *Protopine nitrate* $C_{20}H_{19}NO_5 \cdot HNO_3$ was produced instead of the expected nitroso compound when the alkaloid in hydrochloric acid was treated with freshly generated nitrous acid.
2. *Protopine - iodo - methylate* $C_{20}H_{19}NO_5(CH_3)I$ as described above.
3. *Hydroprotopine* $C_{20}H_{21}NO_5$ (m. p. 151-152°), by reduction of protopine in acid solution with sodium amalgam.
4. *Hydrochlorate of same* $C_{20}H_{21}NO_5HCl$.
5. *Quaternary anhydro base of same* $C_{20}H_{19}NO_4$, obtained in the form of hydrochlorate by treatment of hydroprotopine with benzoyl chloride and splitting off of the benzoyl group by heating with hy-

drochloric acid. It can also be prepared as an iodide, by reducing protopine with zinc and hydrochloric acid and then treating acidulated reduced mixture with potassium iodide. The hydrochlorate melts with decomposition at 275° , is not precipitated by addition of ammonia or sodium hydroxide.

6. *Gold double same of above* $C_{20}H_{19}NO_4H AuCl_4$.

7. *Tertiary anhydro base of same* $C_{20}H_{19}NO_4$ (m. p. 145°) made by treatment of hydroprotopine with dried sodium acetate and acetic anhydride or by treating an alcoholic solution of the hydrochlorate of the quarternary base with sodium hydroxide.

8. *Protopine methin* $C_{21}H_{21}NO_5$ (m. p. 136° - 137°) a tertiary base prepared by heating protopine-iodo-methylate with concentrated sodium hydroxide.

9. *Protopine methin iodo-methylate* obtained by treating acetone solution of protopine methin with methyl iodide. This, (in methyl alcohol solution) heated with sodium hydroxide split into tri-methylamine and a nitrogen free body which could not be obtained in crystals or in sufficient purity to analyze.

10. *Iodo-methylate of the tertiary anhydro base* (No. 7 above) by treatment of the latter, in acetone solution with methyl iodide. This occurred in small prisms melting at 230° with decomposition and on heating with concentrated sodium hydroxide gave

11. *Methin base of same* ($C_{21}H_{21}NO_4$) in large needles, melting at 112° . Efforts to split it into an ordinary amine and a nitrogen free body were unavailing although such body was obtained from a dimethyl sulphate compound of the anhydro base, in too small quantities, however, to permit analysis.

12. *A basic body* yielding a gold salt containing from 19.6 to 20.4 per cent. Au was obtained by oxidation of protomethin with potassium permanganate but not in pure form. The oxidation caused a splitting of the protomethin as another product isolated and identified as

13. *Hydrastic acid* $H_2C_9H_4O_6$ (m. p. 174°).

The paper closes with a comparison of the structures of protopine and kryptopine and with account of the preparation of "hydro kryptopine" by method similar to production of hydro-protopin.—Arch. d. Pharm., 250 (1912), Nos. 8 and 9, 590 and 641. (H. V. A.)

Pyramidon Poisoning.—Bechet, Paul E., reports a case of extensive dermatitis medica-mentosa, following the use of pyramidon in the "patent medicine" form of midol. The patient, a man aged 52, had been taking acetanilid for several years. After taking midol in full doses for four days, he began to have considerable pruritus

and irritation back of the ears and on the neck, which within a few hours involved the trunk. The condition progressively increased, and at the end of three days there was an extensive erythematopapular eruption on the face, chest and back. There were also several itchy wheals which were over an inch in diameter. The patient was forbidden the use of midol and treated with an alkaline laxative mixture with local applications of magnesia and zinc oxide, and within three days the eruption had largely subsided.—J. Am. M. Assoc., 1912, v. 59, p. 1289. (M. I. W.)

Pyramidon.—An editorial (J. Am. M. Assoc., 1912, v. 59, pp. 461-462), calls attention to the advertisements in newspapers of a new "headache cure," the advertising slogan of which is that it "contains no acetanilid or phenacetin." The name of the preparation is midol, and on examination it was found to depend essentially on pyramidon for its therapeutic effects. A second preparation of the patent medicine type in which pyramidon is the essential drug, is nurito. A quantitative examination indicates that the composition of this nurito is essentially as follows: Milk sugar, 34 per cent.; phenolphthalein, 6 per cent.; and pyramidon, 60 per cent. (M. I. W.)

Pyramidon and Antipyrine—Incompatibility with Iodine and Iodides.—Tincture of iodine and iodides which are easily decomposed as f-i. syrup of ferrous iodide and HI are incompatible with antipyrine forming iodine addition products. With pyramidon still another reaction takes place by the action of iodine on the methyl groups.

Both chemicals in mixture with stable iodides as those of the alkalies are compatible.

The frequent red coloration of the urine after the administration of pyramidon has been explained by Jaffé, who isolated a red color which is identical with rubazonic acid of Knorr.—Ph. Ztg., 1912, No. 78, 787. (O. R.)

Quinine—Detection in the Presence of Pyramidon.—C. Mannich and L. Schwedes, of the Pharmaceutical Institute, University of Göttingen, found that the thalleioquin reaction will develop a red instead of a green color, even in the presence of a very small quantity of pyramidon. In order to obtain a normal reaction the pyramidon must be removed, which can easily be done owing to its great solubility in water.

The herapathit reaction is also retarded in the presence of pyramidon, in which case more iodine solution must be used.—Apoth. Ztg., 1912, No. 37, 343. (O. R.)

Anhydrous Crystalline Quinine—Production.—J. Ville describes a rapid and easy method for the production of anhydrous quinine in a crystalline state. A current of air charged with ammonia is driven through an aqueous solution of quinine hydrobromide heated on a boiling water-bath, and kept at that temperature during the whole operation. The quinine is thus precipitated in white, crystalline lamellae, which when washed and pressed between porous plates contains no water of crystallization. It melts at 172° - 173° , and on cooling becomes a crystalline mass of fine needles.

Quinine Trihydrate is obtained by the author by allowing an aqueous 2.5 per cent. solution of quinine hydrobromide, treated with half its volume of acetone and made alkaline to very slight opalescence with ammonia, to evaporate spontaneously in a crystallizing dish covered with a funnel.—Pharm. Journ. and Pharmacist, August 17, 1912, 233; from Bull. Soc. Chim. de France, April 20, 1912, 398.

Quinine—Improvement of the "Thalleioquin" Test.—Reminding that the thalleioquin reaction, from Thallos (green twig) and quinia, was accidentally discovered in 1835 by J. J. Andre, Professor of the Military Hospital of Instruction at Metz, Charles H. LaWall traces its history, uses, and the deficiencies that have been encountered since then in its application as a test for distinguishing certain of the cinchona alkaloids, and particularly since the introduction of Liquor Chlori Compositus in the U. S. P. viii, to replace the regular chlorine water. Experiments carefully conducted by Ralph Nelden, a senior student at the Philadelphia College of Pharmacy in 1908, on lines suggested by the author, led to the undoubted conclusion that neither potassium chlorate, potassium chloride, nor hydrochloric acid interfered with the test, but that the presence of oxyacids in the compound chlorine solution was responsible for the failure of the test. It was further found by Nelden that the analogous bromine preparation made by the action of hydrobromic acid upon potassium bromate, produced a reagent which was even more sensitive than the bromine water alone, successful results being reported by Nelden using this new reagent in dilutions of quinine 1 in 3500. Prof. LaWall has since verified all of Nelden's conclusions and made some additional observations and experiments. The reagent, which should not be more than several weeks old, is prepared as follows:

Potassium bromate.....	0.5 Gm.
Hydrobromic acid diluted (10 per cent.).....	10.0 Cc.
Water, q. s.....	100.0 Cc.

Professor LaWall gives explicit direction for procedure in applying this test in the case of unknown solutions. He found that in solutions, in which the amount of alkaloid was unknown, the experiment had to be repeated, using varying quantities of bromine water until the proportion best suited for the particular dilution was ascertained. Furthermore, that by still further diluting Nelden's reagent the results were much more satisfactory, and that more dilute solutions, in large volume (50 to 100 Cc.) gave better results than smaller quantities, it being thus quite possible to get a reaction in a solution as dilute as 1 in 100,000 or even 1 in 200,000; the procedure being as follows:

Take 100 Cc. of the solution in a tall cylindrical bottle, add 5 to 10 drops of the reagent, agitate well and immediately add 10 drops of stronger ammonia water and again agitate.—*Amer. Journ. Pharm.*, Nov., 1912, 484-488.

Quinine—Value and Use as a Local Anesthetic.—Hermann Schelenz directs attention to the confirmation by Emil Schepelmann of the value of quinine as a local anesthetic when, as previously pointed out by v. Fleischl, Brown, and others, it is administered subcutaneously. The principal objection to its use is the pain initially produced when the needle is inserted; but this may be prevented by the addition of a little antipyrin or adrenalin—for example: quinine hydrochloride, 0.3; antipyrin, 0.3 (or adrenalin, 0.0005) to 10.0 of solution. With such a solution the insertion of the needle is absolutely painless; local anesthesia begins in from $\frac{1}{2}$ to 1 minute, becomes total in 6 hours, is quite strong after 10 or 12 hours, and is still perceptible in 24 to 28 hours after administration.—*Pharm. Ztg.*, lvii (1912), No. 41, 413.

Quinine and Urea Hydrochloride.—Richter, H. H., reports a case of localized gangrene following the use of a one per cent. solution of quinine and urea hydrochloride as a local anæsthetic.—*J. Am. M. Assoc.*, 1912, v. 59, p. 878. (M. I. W.)

Quinine Tannate—Commercial Quality.—Puckner, W. A., reports that while quinine tannate is official in most foreign pharmacopœias, and is required to contain not less than 30 per cent. of anhydrous quinine alkaloid, examination of the commercial products available in this country showed them to be of only fairly good quality. One sample contained about 9 per cent. of uncombined alkaloid and, consequently, was bitter and unfit for use.—*J. Am. M. Assoc.*, 1912, v. 59, p. 1158. (M. I. W.)

Scopolamine—Effect of Age on Its Solutions.—According to the investigations of Dr. Fr. Sachs, scopolamine solutions, even when preserved in ampulles, diminish by age in physiological activity in one direction (antagonistic action towards muscarin on the frog's heart), but in the other direction (central paralytic action) they remain unimpaired. Nevertheless the author is not prepared to decide that old scopolamine solutions are as useful for their therapeutic application as narcotics as the freshly prepared solution, a question that can be definitely decided only by clinical observation made directly on man.—Pharm. Ztg., lvii (1912), No. 63, 633; from Berl. Klin. Wschr., 1912, No. 30.

Strychnine—Modification of the B. P. Test for Brucine.—In the British, and in most of the other pharmacopœias, the test for brucine in strychnine is to pour nitric acid on the crystals and to observe whether any red coloration is produced. D. B. Dott says that this test is unsatisfactory inasmuch as it is difficult to properly observe or define a transient tint which quickly changes to a darker color caused by the rapid action of the strong nitric acid on the strychnine, and suggests the following modification of the test: Dissolve 0.05 Gm. of the powdered strychnine in 4 Cc. of a mixture of equal volumes of nitric acid and water, at the ordinary temperature, the color of the solution, after five minutes, should be purely yellow, showing no red or orange tinge.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1912, 436-437.

Strychnine Sulphate—Percentage of Water of Crystallization.—D. B. Dott observes that the neutral sulphate of strychnine is generally represented by the formula $B_2H_2SO_4 \cdot 5H_2O$, but in one or two books it is stated to contain six molecules of water. It certainly contains more than the $5H_2O$, but he has not in any case found a percentage agreeing with $6H_2O$. The loss on drying agrees best with 11.44 per cent., which is the number required for $5\frac{1}{2}H_2O$. The preferable formula is $(C_{21}H_{22}N_2O_2)_2 \cdot H_2SO_4, 5\frac{1}{2}H_2O$.

The acid sulphate loses all its water of hydration in the water-bath, the numbers approximating very closely to 7.69 per cent., which is the figure required for $BH_2SO_4, 2H_2O$.—Pharm. Journ. and Pharmacist, March 30, 1912, 425.

"Tetramethyl Base"—Two New and Very Delicate Tests by its Use as Reagent.—R. J. Carney suggests a modification of Trillat's test for traces of lead and manganese, by means of the organic base tetramethyl - diamino - diphenylmethane, $[(CH_3)_4N_2(C_6H_4)_2CH_2]$, later named "tetra methyl base" by Arnold and Mentzel to

distinguish it from p-phenylenediamine, which had long been known as "tetra base."

The base is prepared as follows: A mixture of 30 Gms. dimethylanilin, 10 Gms. of formaldehyde, 200 Cc. of water and 10 Cc. sulphuric acid, is heated for one hour on a water bath, cooled, made alkaline with an excess of sodium hydroxide and the excess of dimethylanilin removed by steam distillation. Cool the contents of the retort, filter, wash well with water, and recrystallize once from alcohol.

Carney recommends the use of citric acid in place of acetic as originally used by Trillat, as being more stable towards light and does not form a precipitate on heating.

The reagent is made up by dissolving 2.5 Gms. of the "tetra methyl base" in a solution of 10 Gms. of citric acid in 10 Cc. of water, afterwards diluting to 500 Cc.

With any compound of lead or manganese in which the metal has a valence of more than two, a cold solution of the reagent will give a reddish purple color, due to an oxidation product of the reagent.

The reagent is proposed as a very delicate test for gold and ammonia, whereby 0.01 Mg. gold in 50 Cc. of solution may be detected, and from 0.01-0.02 Mg. HN_3 in the same amount of liquid. With very dilute solutions of gold chloride, this reagent forms a very beautiful purple color, which soon changes to blue and then becomes colorless, the blue color reappearing upon warming. Platinum, palladium or other elements, do not interfere, but free mineral acids must be neutralized, then made acid with acetic or citric acid.

Ammonia may be detected with great accuracy by distilling from an alkaline solution and holding a piece of filter paper, moistened with a solution of 2 Gms. of manganous sulphate and 5 Cc. of hydrogen peroxide solution in 200 Cc. of water, in the current of steam as it issues from the tube. Ammonia, if present, forms a brown spot, which turns purple when moistened with the organic reagent.—*Journal American Chemical Soc.*, Jan., 1912, p. 32, v. 34. (L. A. B.)

Toruline.—An active alkaloidal constituent obtained from the *Alcoholic Extract of Yeast*, which see under "Pharmacy."

Vitamine.—A curative alkaloidal substance from yeast which prevents Polyneuritis. See *Yeast* under "Materia Medica."

GLUCOSIDES AND NEUTRAL PRINCIPLES.

New Glucosides—Production by Bio-Chemical Synthesis.—E. Bourguelot and M. Bridel, in continuation of their previous re-

searches on the production of glucosides from mixtures of alcohols and glucose by the synthetic action of emulsin, have now prepared β -iso-propyl glucoside and β -iso-amyl glucoside from the respective alcohols, making nine β -alcohol glucosides which they have so far obtained. These are described as follows:

β -Isoprophyl glucoside occurs in colorless hygroscopic needles, melting at 123° to 125° (corr.); bitter to the taste; soluble in water, alcohol and acetic ether; opt. rot., $-36^{\circ} 3'$; slightly reducing action, but readily hydrolized in aqueous solution by emulsion.

β -Iso-amyl glucoside also forms needle-shaped crystals, which are not hygroscopic and melt at 99° to 100° C.; bitter and nauseous to the taste; opt. rot., $-36^{\circ} 40'$; do not reduce Fehling's solution.—Pharm. Journ and Pharmacist, Nov. 30, 1912, 679; from Journ. de Pharm. et Chim., 1912, 6, 442.

The Glucosides of Digitalis Leaves—Review.—A contribution to this difficult chapter of chemistry is made by Dr. F. Kraft. After reviewing the work of Schmiedeberg and Kiliani and calling attention to the fact that most of Kiliani's work was done with commercial *Digitalinum germanicum*, which is usually prepared from the seeds, he reports his own work on the glucosides extracted from the best quality of digitalis leaves. From the watery infusion clarified with lead acetate and sodium phosphate he obtained (1) a saponin forming three hydrated forms with different solubilities in alcohol, hydrolizing to a sapogenin, a pentose (either arabinose or xylose) and glucose. This saponin is identical with Schmiedeberg's digitonin, but as it differs from Kiliani's digitonin, Kraft suggests naming it *digit-saponin*. (2) *Gitalin* an active glucose is also found in the infusion and is separated from the saponin by shaking out with chloroform. It has formula $C_{28}H_{48}O_{10} \cdot 4H_2O$ and is identical with, but purer than, Kiliani's digitalein, which Kraft shows is contaminated with a trace of digitic acid. *Gitalin* melts at 150 to 155° C. and is quite unstable, passing into the stable, (3) *Anhydrogitalin*, $C_{28}H_{46}O_9$. This melts at 255° C. and hydrolyses to anhydrogitaligenin $C_{22}H_{34}O_5$ and Kiliani's digitoxose. It is therefore similar to, but not identical with Kiliani's digitoxin and gives (as well as does gitalin) the Keller reaction (characteristic of digitoxose) and the Kiliani reaction (characteristic of digitoxigenin). From the alcoholic tincture of the water-exhausted leaves Kraft obtained (4) digitoxin, which he was able to purify, obtaining white powder, melting at 245° C. and not shrinking at 75° - 80° as does the usual digitoxin, because of contamination with anhydrogitalin. This

Kraft proved by purifying commercial digitoxin, separating it into the two bodies just mentioned. He verified the hydrolysis of digitoxin, obtaining as Kiliani did, digitoxigenin, and digitoxose. The alcoholic extract also yielded (5) *Gitin*, a physiologically inactive glucoside containing 55.2 per cent. carbon and 8.06 hydrogen, m. p. 260-265°, hydrolysing into digitogenin and galactose as does Kiliani's digitonin (from digitalis seed) and is therefore presumably identical with it.

Kraft finds the so-called digitoxin of Keller's digitalis assay consists chiefly of gitalin with only a little true digitoxin.—Arch d. Pharm., 250 (1912), No. 2, 118. (H. V. A.)

Phenol-Glucosides—Synthetic Production.—Emil Fischer and Hermann Strauss find that by shaking an alkaline solution of phloroglucine with an ethereal solution of acetobromglucose, a product is obtained which after removal of the acetyl groups yields "phloroglucin-*d*-glucoside." "Resorcin-*d*-glucoside" may be obtained in the same way. Both glucosides are split up by emulsin, and hence belong to the β -series. The authors have also prepared the glucoside of "2.4.6-tribromphenol," which differs from ordinary glucosides in its great insolubility towards alkalies, as might be expected from the strongly electro-negative nature of tribromphenol.—Chem. News, Nov. 15, 1912, 245; from Ber. d. D. Chem. Ger., 45 (1912), No. 12.

Cyanogenetic Glucosides—Additional Cyanophoric Plants.—M. Mirande has obtained from the leaves of *Centaurea crocodylium*, L., 0.0238 per cent. of hydrocyanic acid and from the stems of the plant, 0.0131 per cent., the distillate containing also benzaldehyde; hence he infers that there are produced by the hydrolysis of glucoside the amygdalin group. Similar results were obtained from *Chardinia xeranthemoides*, *Xeranthimum annuum*, *X. cylindraceum*, and *Tenatia fuga*, Scheidw., the latter yielding 0.0119 to 0.0141 per cent. of acid from fresh flowering plants, but no benzaldehyde.—Pharm. Journ. and Pharmacist, Dec. 14, 1912, 749; from Compt. rend. 155 (1912), 925.

Amygdalin—Chemistry.—In continuation of his previous investigations (see Proceedings, 1910, 378), V. K. Krieble has observed that the slightest traces of hydroxyl ions racemise amygdalin and that the cyanide radical is necessary to effect this change. It was discovered that racemic amygdalin consists of 56.25 per cent. of dextro- and 43.75 per cent. of lævo-amygdalin. The circumstance that the racemic mixture, after being dried on the water-bath, shows increased rotation is due to the action of a small quantity of hydroxyl

ions. These hydroxyl ions are generated by the hydrolysis of the barium salt of an as yet unknown acid which is always associated with amygdalin in minute quantities. The author finally succeeded in resolving racemic amygdalin into its optically active constituents. In the course of hydrolysis with moderately concentrated sulphuric acid, *d*-amygdalin is broken up into glucose and *d*-mandelonitrile; with hydrochloric acid it affords glucose and *d*-mandelic acid. *d*-Amygdalin is split up by emulsin into benzaldehyde, glucose, and hydrocyanic acid. The author has already previously observed that *l*-amygdalin behaves similarly.—Schimmel's Rep., Oct., 1912, 22; from Journ. Amer. Chem. Soc., 34 (1912), 716.

The Amygdalin of the Fruit Stones.—L. Rosenthaler extracted amygdalin from the stones of apricots, peaches, plums, cherries and from apple and quince seed and studied each kind to see if it was true amygdalin or isomeric forms of that chemical. His figures which give physical and chemical data of each kind, prove that in each case the product is true amygdalin.—Arch. d. Pharm., 250 (1912), No. 4, 298. (H. V. A.)

Amygdonitrile Glucoside—Isolation from Leaves of Photinia Serrulata.—In 1906 Guignard examined the leaves and other parts of *Photinia serrulata* with reference to the considerable amounts of hydrocyanic acid they yield on distillation. H. Herissey has now isolated the cyanogenic glucoside by submitting the fresh leaves to the process of Bourquelot. It proves to be amygdonitrile glucoside. This is the third instance that this glucoside has been found in plants—first, by the author in *Cerasus padus*; then by Power and Moore in *Prunus serotina*; and thirdly, as above. Possibly prulaurasin or some other glucosides are present as well.—Pharm. Journ. and Pharmacist, Aug. 3, 1912, 159; from Journ. de Pharm. et Chim., 1912, 5, 574.

Pure Arbutin—Synthesis.—At the Eighty-fourth Convention of German Naturalists and Physicians, C. Mannich called attention to the fact that pure arbutin has heretofore not been obtainable from natural sources, even that obtained from uva ursi leaves being contaminated with more or less methyl arbutin. Absolutely pure arbutin has however recently been successfully prepared synthetically. Hydroquinone and acetobromoglucose yield in the presence of alkali tetra-acetyl arbutin, and this yields pure arbutin by saponification with baryta water. So obtained, arbutin has a double melting point. It melts at first at 163° to 164°, then solidifies and melts again at 200° C.—Pharm. Ztg., lvii (1912), No. 77, 774.

Arbutin—Synthesis.—C. Mannich announces the synthesis of this constituent of *Uva Ursi* with other interesting information concerning this glucoside. Finding as did Herissey previously, that commercial arbutin is a mixture of true arbutin with methyl arbutin (thus explaining discordant reports on the melting point of the commercial product) he examined five commercial arbutins with reference to their methyl arbutin content, using the Zeisel method of methoxyl estimation and found percentage of methyl arbutin ranged from 5 per cent. to 40 per cent. In endeavoring to find cause of such variation he personally extracted arbutin from commercial samples of *Uva Ursi* and found the leaves grown in Tyrol furnish arbutin containing at least 25 per cent. methyl arbutin, while the arbutin from Spanish leaves never contains more than 5 per cent. methyl arbutin. He then tried three methods of separation of methyl arbutin from arbutin—formation of potassium compound of arbutin; of the hexamethylene tetramine compound; and of the pentaacetyl compound, but without success as the arbutin so obtained was never free from methyl arbutin. On the other hand, practically pure methyl arbutin was obtained from the mother liquor of the hexamethylene tetramine experiment cited above, and from this methyl arbutin was obtained a tetra-acetyl compound $C_6H_4OCH_2OC_6H_7O_5(CH_3CO)_4$ in the form of silky needles, m. p. 95.5° to 96.5° .

A similar tetra acetyl arbutin $C_6H_4(OH)OC_6H_7O_5(CH_3CO)_4$ was then prepared synthetically by treatment of hydroquinone $C_6H_4(OH)_2$ with aceto-brom-glucose $C_6H_7O_5(CH_3CO)_4Br$, as white prisms, m. p. 136° and this on further acetylation yielded a penta-acetyl derivative, m. p. 144° - 145° , which was identical with the penta-acetyl derivative of natural arbutin. The tetra acetyl compound treated with baryta water gave synthetic arbutin which agrees in all respects with the purest obtainable natural arbutin except that the physical constants are more correct. The synthetic has a double melting point— 163° - 164° , then solidification, then final fusion at 199.5° - 200° ; its angle of rotation is $D-60.34^\circ$; and occurs in snow-white crystals having bitter taste.—Arch. d. Pharm., 250 (1912), No. 7, 547. (H. V. A.)

Asebotin—A Constituent of Kalmia Latifolia Leaves.—The further investigations of E. Bourguelot and A. Fichtenholz have shown that the glucoside isolated by them from *Kalmia latifolia* leaves is not, as supposed by them, a new substance, but is identical with asebotin found by Eykmann in 1883 in the leaves of *Andromeda japonica*. The authors have now isolated the glucoside

from both plants, and have fully established its identity. It has a double melting point, 114° and 153.5° C. (corr.); is lævorotatory $-59^{\circ}6'$; and gives the same red color with ferric chloride. *Kalmia* leaves contain much more, 2.66 per cent., than *Andromeda* leaves, 0.41 per cent.—Pharm. Journ. and Pharmacist, April 13, 1912, 485; from Journ. de Pharm. et Chim., 1912, 296.

Commercial Chrysarobin—Constituents.—F. Tutin and H. W. B. Cleaver have made complete examinations of araroba powder and three samples of commercial chrysarobin, and have obtained, amongst other substances, two new compounds. A sample of chrysarobin which may be considered of average composition has the following approximate composition: Chrysophanic acid (5 per cent.); emodin monomethyl ether (2 per cent.); the anthranol of chrysophanic acid (46 per cent.); the anthranol of emodin monomethyl ether (a small amount); *monomethyl ether of dehydroemodinanthranol*, $C_{16}H_{12}O_4$ (18 per cent.); *ararobinol*, $C_{23}H_{16}O_6$ (4 per cent.); emodin (a trace); an inseparable mixture of substances and amorphous products (about 25 per cent.). Different samples of commercial chrysarobin, however, vary appreciably in the relative proportions of their constituents.

In addition to the above-mentioned constituents of chrysarobin, the araroba powder was found to contain a small amount of sugar, together with traces of the higher fatty acids and of a substance which appeared to be a hydrocarbon.

The "dichrysarobin" and "dichrysarobin methyl ether" of Jowett and Potter have been shown to be mixtures of the anthranols of chrysophanic acid and of emodin, and the anthranol of chrysophanic acid and the monomethyl ether of dehydroemodinanthranol, respectively.—Pharm. Journ. and Pharmacist, Feb. 10, 1912, 157; from Publ. of Wellcome Chem. Research Labor.

Chrysarobin vs. Chrysophanic Acid—Question of Pharmacological Identity.—In a recent number of Rép. de Pharm. (1912, No. 6), P. Lemaire calls attention to the variability of commercial chrysophanic acid, which he attributes to the fact that more or less pure chrysarobins are generally supplied under the name of "chrysophanic acid." In consequence the preparations made with the commercial acid are very variable as supplied in different pharmacies. Commenting on this, the Pharm. Ztg. observes that it is a common practice of the wholesale drug trade in Germany to refer under *Acidum chrysophanicum* in their price lists simply to chrysarobin for definition and description; an obvious error, since the G. P. clearly defines what is to be understood by chrysophanic acid, but, unfortu-

nately, it mentions under the list of synonyms that chrysarobin is identical with acidum chrysophanicum *crudum*. Quoting from Merck's Index III, 1910, it is pointed out that chrysophanic acid, which is also obtainable from rhubarb and a number of other substances, is a distinct oxidation product of chrysarobin, and therefore not identical, and that while it is probable that when chrysophanic acid is prescribed, chrysarobin is intended, this should not be dispensed under the name of acidum chrysophanicum unless the word "crudum" is also appended to the title. Léger, who describes tests for the distinction of the two substances (in Journ. de Pharm. et Chim., 1912, No. 12), expresses the opinion that the substitution of chrysarobin when chrysophanic acid is prescribed is inconsequent, and suggests that the designation of the latter in prescriptions be omitted. He says a study of the literature convinces that the pharmacological activity of the two substances is not identical, and that therefore here also substitution should be strictly avoided.—Pharm. Ztg., lvii (1912), No. 55, 554.

Natural Chrysazine Derivatives.—A. O. Oesterle shows that the chrysazine of which chrysophanic acid, aloë-emodin and rhein are derivatives is not the 1.2.8. trioxyanthraquinone which is now on the market as a synthetic dyestuff, the chrysazine obtained by decomposition from rhein having melting point and other properties quite different from the dyestuff. The paper gives structural formula for rhein based on Oesterle's work.—Arch. d Pharm., 250 (1912), No. 4, 301. (H. V. A.)

Gentiopicroin—Distribution in Gentian Species.—E. Bourguelot and M. Bridel have isolated gentiopicroin from *Gentiana asclepiadea*, *G. cruciata*, and *G. punctata*.—Pharm. Journ. and Pharmacist, Nov. 9, 1912, 581; from Journ. de Pharm. et Chim., 1912, 6, 372.

Gentiopicroin—Action of Emulsin in Neutral Organic Liquids.—E. Bourguelot and M. Bridel have previously shown that emulsin will hydrolyse gentiopicroin in the presence of strong alcohol by mere contact, and that hydrolysis proceeds more rapidly and completely in proportion to the dilution of the alcohol. Experiments have now been made with the glucoside and ferment in methyl alcohol, in acetone, and in acetic ether. In methyl alcohol the action proceeds as it does in ethyl alcohol. In pure acetone emulsin has no action on gentiopicroin. In 90, 80, and 70 per cent. acetone, hydrolysis occurs in gradually increasing amount, but is not complete; in weaker acetone it is complete. In all the last an abundant crystallization of gentiogenin was observed. This substance is eliminated as it is

formed, and, therefore, complete hydrolysis results. Emulsin was macerated in a series of dilutions of acetone, from 100 to 50 per cent., for eight days. After filtration these were treated with gentiopicrin. In all these cases there was no hydrolysis. But with weaker acetone macerations the gentiopicrin was hydrolysed, and that in direct ratio to the amount of water in the acetone. In pure acetic ether there was no hydrolytic action between emulsin and gentiopicrin, but in all the hydrated ethers hydrolysis was complete. In this case the optically-active substance, the glucose formed, was precipitated, which is exactly contrary to the case with acetone. In this instance, also, this progressive elimination enabled the process of hydrolysis to be complete.—Pharm. Journ. and Pharmacist, June 22, 1912, 807; from Compt. rend. 154 (1912), 1259.

Ammonium Glycyrrhizate—Estimation of Glycyrrhizic Acid.—H. Cormimboeuf recommends the following process for the assay of commercial ammonium glycyrrhizate, which eliminates error due to solubility of the glycyrrhizic acid in water. The average composition of a good commercial ammonium glycyrrhizate is as follows: Real ammonium glycyrrhizate, 70 to 75; moisture, about 10; gummy matter, 10 to 15; ash, 1 to 1.5; insoluble organic matter, about 2, the figures in percentages. The estimation of the glycyrrhizate is effected as follows: Two grammes of the substance is dissolved in 50 Cc. of hot water, filtered, and the filter washed with 50 Cc. of hot water. The mixed filtrates are treated with 5 Cc. of normal sulphuric acid, the mixture is set aside for about twelve hours for the glycyrrhizic acid to deposit; it is then decanted on to a filter, and the acid, of which part adheres to the bottom of the container, is washed several times as far as possible, by decantation, using little water each time; the washing is continued until the filtrate no longer gives an acid reaction; the acid on the filter, as well as that on the glass, is then dissolved in ammonia. This solution (A) contains the greater part of the glycyrrhizic acid. The filtrate and washings are evaporated to dryness, when the glycyrrhic acid is deposited as a viscous black mass; by means of a spatula it is worked up thrice with water, 10, 10, and 5 Cc. This is filtered, and the acid collected is redissolved in ammonia; this solution (a) is added to solution (A), and the whole is evaporated to dryness until the weight is constant at 100°. This weight represents the proportion of real ammonium glycyrrhizate in the sample.—Pharm. Journ. and Pharmacist, March 30, 1912, 421; from Ann. Chim. Analyt., Feb. 15, 1912, 47.

Hepatrilobin.—*A New Glucoside from Hepatica*.—Employing the biological method of Bourguelot, A. Delattre has isolated a new glucoside from *Hepatica triloba* growing wild in the neighborhood of Verdun. The amount of the glucoside so far isolated is not sufficient to enable any definite statement as to its chemical nature. Two crops of definite needle-shaped crystals were obtained, both laboratory—the one -127.7° , the other -147.6° ; but this divergence may not indicate two distinct glucosides, but a greater degree of purity of one. Hepatrilobin does not reduce Fehling's solution before hydrolysis, which is effected by emulsin—both this ferment and invertin being constituents of the plant. A sugar, probably sucrose, is also present.—Pharm. Journ. and Pharmacist, Oct. 26, 1912, 519; from Journ. de Pharm. et Chim., 1912, 6, 292.

Picrotoxin.—*Chemical Constitution*.—It has been an open question whether picrotoxin is a definite compound or merely a mixture of two distinct substances—picrotoxinin ($C_{15}H_{16}O_6$) and picrotin ($C_{15}H_{18}O_7$)—into which it easily decomposes. J. Sielisch has investigated this question by molecular weight determinations in glacial acetic acid, and by other methods, and shows that picrotoxin is not a mixture, but an easily decomposed compound of the two substances in question.—Pharm. Journ. and Pharmacist, Sept. 21, 1912, 371; from Liebig's Annalen, 391 (1912), 1.

Quebrachite (Læevo-Inositol) a constituent of the leaves of *Grevillea robusta*, which see under "Materia Medica."

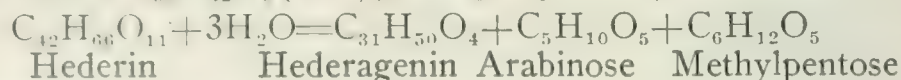
Salicin.—*Action of Emulsin in Presence of Alcohol*.—E. Bourguelot and M. Bridel, having shown that emulsin in powder by mere contact hydrolyses gentiopiecin in the presence of even strong alcohol, experiments on similar lines have been made with salicin. The results are similar, but the ferment does not act quite so vigorously as on gentiopiecin. Thus, salicin in solution in alcohol 95 per cent. is not hydrolysed by emulsin. Gentiopiecin is slightly. But in alcohol of 90 per cent. the hydrolysis of salicin is very distinct, but slow; 31.7 per cent. is hydrolysed in forty-eight days. In 85 per cent. alcohol, the amount decomposed is 45.3 per cent. in forty days; in 80 per cent. alcohol, 53.6 per cent. in fifteen days, and more in a shorter time with weaker spirit. In alcoholic solution of both ferment and glucoside, complete hydrolysis does not occur with salicin. Nor does it even in aqueous solution; after a time an equilibrium is attained which is not exceeded. About 95 per cent. of the total salicin present is hydrolysed.—Pharm. Journ. and Pharmacist, June 8, 1912, 747; from Journ. de Pharm. et Chim., 1912, 388.

Santonin—Manufacture in Turkestan.—From an interesting article on the production of santonin in Turkestan, which appears in "Westnik finansow" (1912, No. 88), it appears that the manufacture of this important vermifuge is confined practically to Turkestan, where extensive manufacturing plants have been established since the Russians have taken possession; and since the habitat of the plant (*Artemisia Cina*), from which it is prepared, is restricted to a small territory of the earth's surface, and confined to Russian Turkestan, the supply of material has become a Russian monopoly and, in consequence, that of the product also. While the plant grows only within narrow limits on the left bank of the Syr-Darja it grows profusely on the right bank of the river, extending over the entire plain, between the large and small streams, up to the Altas range of mountains. Most of this land, which is inhabited by the nomad Kirgise, has been acquired by the Russian crown and is rented out on certain terms covering exclusive right to collect the flowers. During the harvest of the flowers, which is confined to a very brief period (usually between the 15th or 20th of August, and the 1st or 5th of September), the manufacturers open storage centers for the reception of the crop, which are again closed at the end of the harvest, and the collection requires the watchful care of a large number of employes, since the flowers must be collected at the proper period of development—the santonin-content being greatest when just opening. The average yield of flowers is estimated at fifty to sixty thousand puds (one pud=16.375 kilograms, Rep.), but in some years is as low as 40,000 puds, of which a large portion is exported. The manufacture begins immediately after the harvest, the average yield of santonin (more or less crude) being one part from 150 parts of flowers. The produce, which is mainly exported to Germany, is about 400 puds, but occasionally has been as high as 1500 puds. The refuse material (dregs) is used as fuel after drying and forming into "briquets."—Pharm. Ztg., lvii (1912), No. 77, 778.

The Saponins of the Araliaceæ—Examination.—A. W. Van der Haar reports examination of the following principles resembling saponin.

The Saponins of Polyscias nodosa belong to the series $C_{22}H_{36}O_{10}$ to $C_{25}H_{42}O_{10}$, and from these Van der Haar obtained by hydrolysis dextrose, arabinose, methyl pentose and polyscias sapogenin, the latter occurring in rhombic crystals, m. p. 324° and having the formula $C_{26}H_{44}O_4$. It gives the characteristic sapogenin reaction with sulphuric acid and contains a lactone group.

Hederin, the principle from *Hedera helix*, has already been studied and named, but the product was obtained only in impure form. From it Van der Haar has isolated two glucosides and one of these which he names Hederin, he has carefully studied. This body melts at 256°-257°, is insoluble in water, shows the characteristic saponin reaction with sulphuric acid, but not the barium hydroxide reaction, gives a penta-acetyl derivative and contains one oxymethyl group. Its formula is $C_{30}H_{42}O_5(OH)_5OCH_3 \cdot 2H_2O$. It hydrolyses as follows:



Hederagenin melts at 325°-326°, is in rhombic crystals, shows the sulphuric acid-sapogenin reaction, contains two hydroxyl groups and a lactone group. On distillation with zinc dust, yields a green-yellow fluorescent oil smelling like oil of amber. This was separated into two portions by steam distillation; that passing over with steam being a sesquiterpene $C_{15}H_{24}$ (b. p. 245°-255°), while the residue appears to have the composition $C_{21}H_{40}$.—Arch. d. Pharm., 250 (1912), No. 6, 424. (H. V. A.)

Saponins—Biological Estimation in Drugs.—At the March session (1912) of the German Pharmaceutical Society, Professor R. Kobert delivered an extremely interesting and instructive address in which he points out that the biological valuation of the active constituents of drugs (supplementary to the chemical valuation), which is now conceded to be practically indispensable in the case of digitalis, may be confidently extended with advantage to other drugs and more particularly to those containing saponins, such as Guillaya, Senega and Sarsaparilla, for example. The physiological action of these vegetable substances is highly interesting. Applied externally the saponins exert epithelium destructive activity, and are strongly irritant, properties which have been utilized as expectorants (Senega), etc. Internally administered the saponin drugs exert diuretic and perspiratory action, and as a consequence of their irritant effect on the stomach and intestines, particularly in large doses, are capable of relieving diarrhoea and emesis. When injected into the blood vessels the saponin are shown to be powerful protoplasmic poisons, destroying the blood corpuscles and apparently dissolving them. This property Professor Kobert now proposes to utilize for the biological valuation of drugs containing saponins. If defibrinated blood is diluted with 50-100 times its volume of physiological salt solution and a saponin solution is then added, the opaque blood corpuscles instantly assume a lacke-color and become trans-

parent. This action is, however, not due to actual solution, but to the fact that the saponins combine with the cholestrin of the blood corpuscles, which then become transparent. The valuation of saponin drugs is carried out as follows:

A decoction of the air-dry drug is made in the proportion of 1:100, and this is added in successive portion of 1, 2, 3, etc., cubic centimeters to a series of test tubes, each containing 5 Cc. of a 2:100 solution of blood in physiological salt solution, followed by sufficient of the salt solution to make up the volume to 10 Cc., observing in what dilution hæmolytic action sets in. If in addition the activity-value of the saponins contained in the drug is known, the percentage of active substance in the drug is simultaneously determined. In this manner Prof. Kobert has determined a content of 8-10 per cent. of saponins in guillaya bark, and that the activity of the bark remains constant for years. On the other hand, in the case of senega and sarsaparilla a diminution of the active constituent was shown after prolonged keeping.—Pharm. Ztg., lvii (1912), No. 21, 213-214.

Saponin—Reliability of the Hæmolytic Method of its Biological Valuation.—Dr. Cesaro Sormani and also J. Rühle have made comprehensive experiments with the hæmolytic method proposed by Prof. Kobert (see preceding abstract) for the biological valuation of drugs containing saponins. The degree of hæmolysis is ascertained with accuracy in the case of saponin by this method, whereas the reactions of Vamaka, as well as the various color reactions for saponin are untrustworthy.—Pharm. Ztg., lvii (1912), No. 55, 555; from Ztschr. f. Unters. d. Nahr. u. Genussm., 23 (1912), No. 11.

Saponin—Composition.—Interesting insight into the composition of this body is given by Rosenthaler and Strom, who have prepared several products from the Gypsophila-saponin of Merck and from their results draw some new conclusions as to the structure of saponin.

Hydrolysis with 3 per cent. sulphuric acid yields a body which they call *Pro-Sapogenin* since it still contains some carbohydrate. It melts (turning brown) at 207° , has index of polarization $+11.92$ at 18° , contains no methoxyl group and has formula (presumably) $C_{30}H_{48}O_{12}$. It gives a semi-carbazone melting irregularly between 210° and 241° . Hydrolysis with 2 per cent. sulphuric acid under pressure (in autoclave) gives *Sapogenin* $C_{24}H_{34}O_5$, m. p. 267° - 268° $[\alpha]^{18}_D = +90.86$. From it was prepared methyl-sapogenin, $C_{24}H_{36}O_5CH_3$, di-acetyl sapogenin $C_{24}H_{32}(CH_3CO)_2O_5$, a semi-carbazone $C_{24}H_{34}O_4COH_3N_3$; while by oxidation with permanganate was obtained a symmetric dimethyl-succinic acid, m. p. 130° - 131° . From

their work, the authors decide that saponin has the formula



—Arch. d. Pharm., 250 (1912), No. 4, 290. (H. V. A.)

Saponin—Detection in Frothing Liquids.—The use of saponin to produce frothing liquids is prohibited in France. M. Loncheux, during an examination of a liquid, failing to obtain positive results by Rühle's process, applied Kobert's process, slightly modified. This consisted in precipitating the liquid with lead subacetate, centrifuging, taking up the precipitate with water, treating with H_2S , concentrating the filtrate, shaking out with ether, filtering, washing with ether, and dissolving in hot water. On evaporating to dryness, a bright extract was obtained, of irritating taste, strongly frothing properties, and generally having the properties of saponin.—Pharm. Journ. and Pharmacist, Nov. 23, 1912, 649; from Rep. de Pharm., Sept. 10, 1912, 399.

Saponin—Detection in Oily Emulsions.—According to Carlinfonti and Mazzocchi, the following method may be employed for the detection of saponin in emulsions of oil, etc: 100 Gm. of the emulsion is diluted with an equal volume of water in a beaker, and 400 Cc. of alcohol of 95 to 96 per cent. strength is then added gradually, mixing well by agitation, which is repeated at intervals during two hours, and the mixture then set aside for twenty-four hours. The bottom of the vessel will then be covered with an unctuous mass, with a clear liquid above it; this liquid is poured off through calico, the residue digested with alcohol of 60 to 65 per cent. strength, and this poured off through the same cloth, to which the magma is finally transferred for pressing; the total liquid passing through is united and filtered through paper, neutralized with soda if necessary, and evaporated on a water-bath to 100 Cc.; it is then extracted with ether, which removes aromatic substances and traces of fat, and after warming, to dispel dissolved ether, 20 Gms. of ammonium sulphate and 9 Cc. of phenol are added and the whole shaken well and repeatedly left to stand for twenty-four hours. The phenol solution is then separated and shaken with a mixture of ether 100 Cc., water 30 Cc., and alcohol 5 Cc. and left to stand for twenty-four hours. The aqueous layer now contains the saponin; it is evaporated to dryness on a water-bath and the residue purified by repeated washing with acetone. This method may also be used for the detection of saccharin in emulsions, and of saponin in foaming liquids.—Pharm. Journ. and Pharmacist, March 9, 1912, 319; from

Bull. Chim. Farm., through Ztschr. d. Allgem. Oesterr. Apoth. Ver., Jan. 6, 1912, 2.

Strophanthus Glucoside—Comparative Investigation.—A. Heffter and F. Sachs have determined by a comprehensive investigation of the strophanthus glucosides that the amorphous strophanthin of *Strophanthus hispidus* closely resembles the strophanthin of *S. Kombé*, both in its physiological activity and in chemical characters. Besides this amorphous strophanthin, however, the kombé seeds contain a crystalline strophanthin. While the gratus-strophanthin of Thoms is only slightly bitter, the others mentioned are all markedly bitter. Crystalline kombé-strophanthin alone has the property, in a slight degree, of disintegrating the red blood corpuscles. Its toxicity on rabbits is very close to that of the amorphous glucoside, and less than that of the gratus-strophanthin, but there appears to be very little difference in its action on the human subject from the amorphous glucoside with which it is associated.—Pharm. Journ. and Pharmacist, Aug. 24, 1912, 271; from Biochem Ztschr., 40 (1912), 83, through Chem. Zentralbl., 1912, 130.

Vanillin—Difficulties in the Colorimetric Estimation.—W. S. Hubbard states that the A. O. A. C. method for the colorimetric method of determining vanillin does not give satisfactory results.

He finds that there is a loss of vanillin when lead cream is used as a clarifying agent, a portion of the vanillin being carried down as a lead salt of the composition of $(C_8H_7O_3)_2 Pb$.

A more intense color is formed if the ferrous sulphate be added, as given in the original method of Moerk's, instead of the bromine water.—Journ. Ind. and Eng. Chem., Sept., 1912, Vol. 4, p. 669. (L. A. B.)

Vanillin—A New Colorimetric Method for its Determination in Flavoring Extracts.—Otto Folin and W. Denis have proposed the following method for the colorimetric determination of vanillin in flavoring extracts:

Transfer 5.0 Cc. of the sample to a 100 Cc. flask and add 75 Cc. water, then add 4 Cc. of the lead acetate solution and sufficient water to make 100 Cc.

The contents of the flask are rapidly filtered and 5 Cc. of filtrate placed in a 50 Cc. flask, then add 5 Cc. of the phosphotungstic-phosphomolybdic reagent, shake, and allow to stand for five minutes, then fill to the mark with a saturated sodium carbonate solution. Invert the flask two or three times, allow to stand for ten minutes for any precipitate to settle, then filter rapidly and compare the deep

blue solution with a standard solution prepared in like manner, in a Du Bosc colorimeter.

The reagents required are (1) an aqueous solution of pure vanillin, containing in each 10 Cc., 1 Mg. of vanillin; (2) the phosphotungstic-phosphomolybdic acid reagent, prepared by heating 100 Gm. sodium tungstate, 20 Gms. phosphomolybdic acid, or molybdic acid (free from ammonia or nitrates), 100 Gms. 85 per cent. phosphoric acid, and 700 Cc. water, and boiling over free flame for one and one-half hours, cool, filter, and make up to one liter; (3) a solution of sodium carbonate saturated at room temperature.

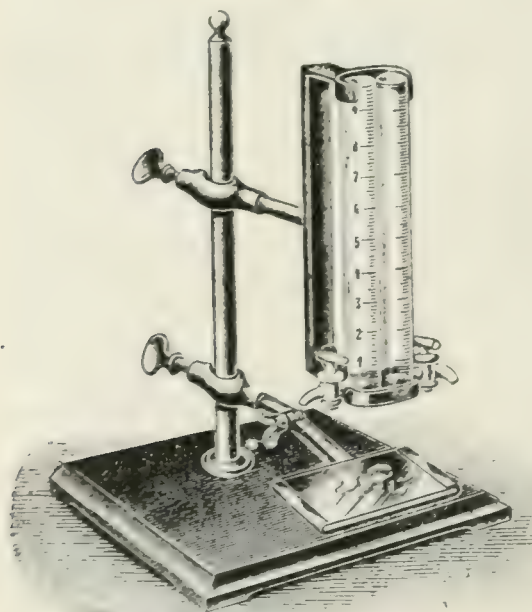
Care should be exercised to see that the intensity of color in the standard and sample to be read is approximately the same, also in setting up colorimeter to see that the illumination of both fields is the same, so that comparisons of the standard can be made within at least 0.2 Mm.

It is essential that both solutions shall be perfectly clear, otherwise erroneous results will be obtained. The results of several analyses show good comparisons with the more laborious gravimetric official method.—Journ. Ind. and Eng. Chem., Sept., 1912, Vol. 4, p. 670. (L. A. B.)

COLORING MATTERS.

New Colorimeter—Simple Construction.—Dr. F. Toggenburg describes the new colorimeter shown by Fig. 48, which excels in simplicity of construction and manipulation. It is composed of two

FIG. 48.



New Colorimeter.

Hehner cylinders, each of 100 Cc. capacity, graduated into 1/1 Cc., and closely beside of each other on a simple support, but easily transposed either in a horizontal or vertical direction. A mirror-illuminator of simple construction can be appended if desired. After some practice, it becomes possible to make the comparison of the tints without resort to the reflection-prism. The faucets on the Hehner cylinders permit the accurate adjustment of their contents. The colorimeter is supplied by the firm Niggli &

Co., Zürich.—Pharm. Ztg., lvii (1912), No. 76, 768.

Vital Coloring and Chemo-therapy.—W. Schulemann has published a long and important paper on the above subject, which is difficult to condense and to the original of which the reader must be referred for details. He takes up Ehrlich's side chain theory of therapeutic activity and tries to prove method of action by those synthetic colors which give permanent stain to the living cells of animals (mice and rabbits). Among his conclusions the following may be given:

1. Relationship to chemical structure and vital coloring is hard to fix; one dye coloring well, while another quite similar to it does not stain.

2. Those dyes which do not produce vital coloring are suspended colloids, while those which do color are hydrophile colloids.

3. As to the dyes producing vital coloring, their dying property depends primarily on relative positions of chromatophore and auxophor groups, and secondarily on number and position of the sulphonic acid groups. The influence of the latter is mainly due, however, to the influence they exert on the solubility of the dye.

4. As just intimated, the chemical constitution of the dye exerts only an indirect influence on its ability to produce vital coloring and that chiefly on physico-chemical grounds.

5. The writer endeavored to study the mechanics of the passage of the dye from cell to cell and of its fixation in some cells rather than others. Of method of transportation he seemed to learn but little, beyond the fact that frequently when a mixture of two dyes is injected, one reaches certain cells more rapidly than does another.

6. As to fixation, the vital coloring seems to be produced only in cells possessing a special type of fixing chemical and that this chemical fastens the dye stuff to the cell granules by forming a product similar to the alum lakes, but of course of very complex nature.

In a second paper, Schulemann points out some of the weaknesses of the difficult task he has undertaken. Among these points are (1) variable quality of commercial dyes, making it difficult to know if the dye is a definite chemical or a mixture; (2) temperature at which the dye stuff in solution prepared is of importance inasmuch as heat produces colloidal condition of the dye. Therefore the solution must be prepared cold; (3) strength of the solution and quantity injected. 1 Cc. of 0.5 per cent. solution for 20 Gm. mouse gives the best results. (4) With some dyes it is very difficult to distinguish between vital coloring and some side reactions with the

cell contents; (5) some organs stain much better than others, the kidneys being particularly sensitive to the dyeing action; (6) the age of the animal has an influence, although not especially so with mice. A two-day old goat did not show vital coloring, while older goats respond very well.—Arch. d. Pharm., 250 (1912), Nos. 4 and 5, 252 and 389. (H. V. A.)

Chlorophyll—Questionable Importance of its Influence on the Transpiration of Plants.—Leclerc du Sablon contends that the importance of the influence of chlorophyll on the transpiration of plants has been exaggerated by Wiesner and his followers. He finds that transpiration is due to the increased permeability of the tissues under the stimulus of light. It is found by experiments that transpiration is as rapid from leaves which contain no chlorophyll as from those normally colored. These results were obtained by placing etiolated, bleached, and variegated leaves, freshly gathered, with the petioles immersed in small tubes of water having a floating layer of oil on top. These were weighed, and then exposed to similar conditions of illumination, in sunlight or shade for definite periods of time. The loss of weight observed was the same with leaves containing no chlorophyll as in those which were normally green, or which were slightly variegated.—Pharm. Journ. and Pharmacist, Nov. 16, 1912, 613; from Compt. rend., 155 (1912), 847.

Hydrocoerulignone—Reactions.—Taking as text a paper by J. Mair (Proc. Chem. Soc., London, 26, 115), on the above-named chemical, Professor E. Schär shows the similarity in its action on copper salts and hydrogen dioxide to those shown by guaiac with the same chemicals (Schär's Reaction). He, therefore, reviews his work, giving bibliography from 1868 to date and points out that when certain bodies yielding typical colors on oxidation (e. g. hydrocoerulignone, guaiac-resin, alum, pyrogallol and guaiacol) are brought in contact with catalytic agents (such as copper, ferrous and platinum salts, colloidal solutions of metallic gold and platinum) or peroxydases—e. g. blood pigments, malt enzyme, laccase and enzymes of acacia—and with a third substance (such as hydrogen peroxide, cyanogen compounds or even alkaloids or other feeble alkalies) the characteristic coloration occurs.

The presence of three types of chemicals is essential, any two of these producing no more than a faint coloration; and the oxidation (except when hydrogen dioxide is used) can be ascribed to the oxygen of the air. As to the hydrocoerulignone reaction,—the

changing from green-yellow $C_{16}H_{18}O_6$ to red coerulignone $C_{16}H_{16}O_6$ when treated with hydrocyanic acid and copper sulphate—he points out that it can be used as a test for cyanides; for blood (controlling Schär's test) and for free alkaloids.—Schweiz. Wschr. f. Chem. u. Pharm., 1 (912), Nos. 22 and 23, 321 and 337. (H. V. A.)

Luteine—*The Yellow Pigment of Egg-yolk*.—Willstätter and Esch have isolated, in a crystalline state, the yellow pigment of yolk of egg, and have pronounced it to be closely related to the xanthophyll of green leaves. From about 6000 hen's eggs (yolks), about 4 grammes of crude pigment was obtained; this was purified by crystallization from a variety of solvents. Analysis shows it to be an isomeride of xanthophyll, and this is confirmed by the study of the absorption spectrum and other properties. It is proposed to name the substance "luteine."—Pharm. Journ. and Pharmacist, March 9, 1912, 319; from Ztschr. f. Physiol. Chem. 76, No. 2 and 3, through "Nature," 1912, 493.

Yellow Coloring Matter of Ergot—*Character, Composition and Chemical Relations*.—Albert Freedom briefly reviews the characters of three yellow coloring matters from ergot herebefore described by different experimenters, namely:

Sclerocrystallin, $C_7H_7O_3$, obtained by Dragendorff and Podwysotszki (1877) in form of pale yellow needles;

Ergochrysin, $C_{21}H_{22}O_9$, obtained by Jacobi (1897) both in yellow crystals and amorphous; and

Secalonic Acid, $C_{14}H_{14}O_6$, obtained by Kraft (1906) in form of citron-yellow needles.

On comparing the descriptions of these three substances, the author says, we are forced to the conclusion that they are identical, and assuming Jacobi's molecular weight to be correct, his formula $C_{21}H_{22}O_9$ is the right one for the anhydride, while Kraft's formula, $C_{14}H_{14}O_6$, for secalonic acid is based upon analytical data that agree almost as well with the formula $C_{21}H_{22}O_9$, as with the one chosen by him—this applying also to the less accurate analyses of Dragendorff and Podwysotszki.

By a method described, Mr. Freedom has now obtained a crystalline yellow coloring matter from ergot, which in several respects resembles that described, but which has the formula $C_{15}H_{14}O_7$ when dried *in vacuo* over sulphuric acid. It is further distinguished by the very high melting point, $338^\circ C.$, whereas Kraft's secalonic acid melts at 244° . The substance in question was obtained pure in the

form of pale yellow needles, scarcely soluble in water, and sparingly soluble in alcohol or ether, but more readily soluble in chloroform, and quickly soluble in solutions of sodium hydroxide or carbonate with a golden yellow color. The author has obtained the acetyl derivative, which is shown to be derived from the anhydride, $C_{15}H_{12}O_6$, of the coloring matter, the latter probably belonging to the "flavone group" of coloring matters.—Pharm. Journ. and Pharmacist, May 4, 1912, 568-569.

ALBUMINOIDS

(Including Animal Products.)

Albumin—History of the Reagents.—Beta-Naphththalene-sulphuric acid was proposed as a reagent by E. Riegler in Jassy, and is so sensitive as to detect one part of albumin in 40,000. Sulphosalicylic acid, or salicyl-sulphonic acid, was proposed by MacWilliam and detects as little as one part of albumin in 130,000 parts of urine. Sulphosalicylic acid was discovered by Auguste Cahours in 1843 and further researches were made by O. Mendius in the chemical laboratory at the University of Göttingen. Since 1889 it has been manufactured on a large scale by Von Heyden. A test paper has also been introduced, but has been found to deteriorate. As a reagent for albumin in urine, it was introduced by MacWilliam and approved by Emil Fischer.—Ph. Zhalle, 1912, 1145. (O. R.)

Albumins—Determination of the Different Kinds in Urine.—After illuminating the various errors that arise during systematic urine examinations, Grimbert gives accurate descriptions of the methods for the determination of the different kinds of albumen that may be present in urine. The importance of the subject makes a detailed description of these methods very desirable, but it must suffice here to briefly describe the preliminary experiments leading to the identification of the different albumins that may be present, leaving the details of carrying out the individual experiments for consultation in the original: To 10 Cc. of the filtered urine 10 Cc. of a saturated solution of sodium chloride and 2 drops of nitric acid are added. A turbidity or precipitation results, and the mixture is heated to boiling. If the turbidity disappears *primary albumen* alone is present; but if it remains, then *serin, globulin, or acetic acid-soluble-albumen* are present. The mixture is now filtered. If the filtrate remains clear after cooling, but gives the biuret reaction, the presence of *secondary albumoses* and *peptones* is indicated, while failure to give the biuret reaction demonstrates

their absence. If, however, the filtrate become turbid on cooling and gives the biuret reaction, only *primary albumoses* are present.—Pharm. Ztg., lvii (1912), No. 64, 644-645; from Journ. de Pharm. d'Anvers., 1912, No. 13.

Albumin—Examination in Sputum.—Works, B. O., describes the following technique for the quantitative examination of albumin in the sputum in pulmonary tuberculosis. The previously measured sputum is treated with 3 per cent. acetic acid to coagulate the mucin. Enough distilled water is then added to make a 33.3 per cent. solution. After thorough shaking the mixture is filtered and the filtrate tested for albumin. If more than a trace of the latter is present a quantitative test for albumin is made with Esbachs tube; the reading being multiplied by three to correspond with the sputum present. He states that all patients with active pulmonary tuberculosis give a positive albumin reaction. The most active cases show 0.2 per cent. or more albumin.—J. Am. M. Assoc., 1912, v 59, pp. 1537-1538. (M. I. W.)

Iodine-Albumin Compounds—Natural Occurrence.—According to A. Ostwald, the skeletal portions of the coral *Gorgonia cavolini* is composed of an albumin compound rich in iodine, named "gorgonin." When hydrolysed this yields a large amount of organically combined iodine, including 0.9 per cent. of di-iodotyrosin. Gorgonin contains 7 per cent. of total iodine, and of this iodine no less than 83 per cent. is in the form of intimate organic combinations, including 7.4 per cent. of it as di-iodotyrosin. Spongin, the albuminoid of the skeleton of sponges, also contains a considerable amount of iodine in organic combination. The amount separated in this form appears to vary with the period of duration of hydrolysis. In the case of *Fucus vesiculosus* there does not appear to be much iodine intimately combined with albuminoids. After hydrolysis practically the whole of it exists as hydriodic acid. When the plant is macerated in the cold with alkaline solutions, it parts with 25 per cent. of its iodine but this is all as alkali iodine.—Pharm. Journ. and Pharmacist, Feb. 24, 1912, 249; from Ztschr. Physiol. Chem., 75, 353.

Iron Albuminate.—W. Grüning, of Riga, in an extensive paper, gives the chemistry, describes the official solutions, the position of the iron albuminate among the other official iron preparations, and ferrialbumin and ferrialbumin acid. For particulars the original paper must be consulted. The author lays special stress upon the fact that the Dieterich formula, using the dry egg albumin, produces

a far superior and more stable material than the formula of the new German Pharmacopœia, which employs 7.5 per cent. of fresh egg albumin instead of 3.5 per cent. of the dry albumin. He also finds that 75 parts of fresh egg albumin only represent 9 parts of dry albumin and that consequently the present solution of iron albuminate is weaker than the old one.—Ph. Zhalle, 1912, No. 44, 45. (O. R.)

Milk—Test for Freshness.—The reagent is prepared by diluting 0.1 Cc. of a saturated alcoholic solution of methylene blue with 70 Cc. of distilled water. Of this solution 1 Cc. is mixed with 50 Cc. of milk, 30 Cc. of alcohol are added, and the mixture is kept at about 37° C. and exposed to light. If the milk is not fresh the color will be discharged within 30 minutes.—Sc. Am., 1912, No. 24, 531. (O. R.)

Milk—Cause of Turning Sour During Thunderstorms.—A. Trillat finds that minute traces of the various gases gives off during putrefaction of organic matter, when they come in contact with milk under slightly reduced atmospheric pressure, greatly increase the formation of lactic acid and accelerate the process of lactic fermentation. The same milk, exposed to a reduced atmospheric pressure in pure air, does not become sour, or clot, in the same time. Also controls exposed under normal atmospheric pressure in presence of traces of putrefactive gases do not exhibit the same degree of acidity in a given time, as the milk under reduced pressure. The author points out that in "thundery weather" the temperature is usually high, and the atmosphere charged with moisture, both conditions most favorable to the evolution of gases. It is, therefore, to the simultaneous occurrence of these conditions, rather than to the electrical disturbances which accompany them, that the "turning sour" of milk may be attributed.—Pharm. Journ. and Pharmacist, Sept. 14, 1912, 345; from Compt. rend., 154, (1912), 613.

Milk—Acidity.—Fresh milk has an alkaline reaction with helianthin and lacmoid, an amphoteric reaction with lacmus and an acid reaction with phenolphthalein. F. Bordas and F. Touplain have shown that the acid reaction of milk when phenolphthalein is used as an indicator depends upon the free casein. The same authors have also proven that fresh milk does not contain any free acids, as lactic or citric acid, or any acid salts.—Annal. Falsific. 4, 1911, 297. (O. R.)

Milk—Preservation with Peroxide.—Researches made by H. Willeke, H. Schellbach and W. Silke have proven that H₂O₂ or

peroxides are not ideal milk preservers. Præservol, Perservoid, Soldona and several other preparations are chiefly 3 per cent. H_2O_2 , and do not fulfill their claims, and their use is forbidden by law. Traces of H_2O_2 in milk can only be detected soon after their addition but 0.1 per cent. can be positively proven by the vanadic-sulphuric acid reaction. The nitrate reaction of the serum with diphenylamin-sulphuric acid can also be due to the addition of H_2O_2 .—Ztsch. Unt. N. & G., 1912, Bd. 24, H. 3. (O. R.)

Cow's Milk—Iron-Content.—F. Edelstein and F. v. Csonka mention that the figures recorded in the literature for the amount of iron in cow's milk vary between the wide limits of 1 Mgm. and 15 Mgm. per litre. The authors have investigated this subject more particularly to find out if cows' milk contains a greater or less amount of iron than human milk. Cows' milk collected directly into glass vessels was found to contain from 0.4 to 0.7 Mgm. per litre, averaging 0.5 Mgm. Human milk contains one-third to one-half this amount. The wide differences in the results previously recorded are due to the nature of the vessels used in collecting and storing the milk.—Pharm. Journ. and Pharmacist, March 16, 1912, 353; from Biochem. Ztschr., 38 (1912), 14.

Artificial Milk.—The Lonodn correspondent (J. Am. M. Assoc., 1912, v. 59, pp. 1636-1637) calls attention to an artificial milk manufactured from soya beans, which is said to contain all the elements of the best cow's milk and can be used for the same purposes. This artificial milk is said to be more digestible than ordinary milk and its cream more nourishing. It can be used for all cooking purposes and good cheese can be made from it, but it will not produce butter. As it is germ-free it will keep longer than cow's milk. The discovery is the work of three Germans who spent three years in perfecting it. (M. I. W.)

Milk-Oxydases, Catalases and Reductases.—Dr. A. Splittgerber, of the Chemical Division of the Hygienic Institute of Dr. M. Neisser, Frankfurt, has made a detailed study of these agents and has reached the following conclusions:

I. The oxydases and peroxydases are present in variable quantities in the milk of different mammalia. Peroxydases can be determined in cow's milk which is not heated beyond 80°C . Arnold's reagent, that is tincture of guaiac, when fresh, is active without hydrogen peroxide. Storch's reagent, that is paraphenylendiamin and hydrogen peroxide, is not active in milk containing preservatives. Rothenfusser's reagent, consisting of an alcoholic solution of

paraphenyldiaminichlorhydrate and guaiacol, when added to the lead acetate serum of milk in the presence of hydrogen peroxide, is so sensitive as to detect 1 part of raw milk in 1000 parts of boiled milk.

II. Catalases have the property of decomposing hydrogen peroxide into water and molecular oxygen, which latter can be collected and measured in a specially constructed apparatus. The origin of catalases are still undetermined and are either caused by micro-organisms or enzymes.

III. Reductases have the property of decolorizing methylene blue, either with or without formaldehyde. For further particulars the original voluminous paper must be consulted.—Ph. Zhalle., 1912, 46-51. (O. R.)

Egg—The Coloring Substance of the Yolk.—N. U. Barbieri treats the yolk with carbon disulphide, alcohol, chloroform and acetone consecutively and obtains a brownish yellow-hygroscopic powder soluble in equal parts of water, soluble in fats and oils, but insoluble in alcohol, chloroform and acetone. The author names this substance *Ovochromin*. It is slightly acid, contains C, H, N, O and S but no P or Fe, and does not give the biuret reaction.—Compt. rend., 1912, No. 25. (O. R.)

Egg-yolk Lecithin—Variability of Composition.—According to an interesting contribution in Riedel's *Berichte*, 1912, the main difficulty in the study of the chemistry of egg-yolk lecithin depends upon the fact that instead of single products only phosphated mixtures have heretofore been available, which proved to be difficult to purify and to characterize. This explains the numerous varying and conflicting results that have been obtained. It is shown, however, that it is quite possible to separate the lecithin from the other egg-yolk constituents to quite a considerable degree, and that a method also exists that prevents change during the process of preparation. But the separation of the individual lecithins from each other and from the accompanying phosphatids as yet remains an unsolved problem. A most promising way towards the production of chemically identical lecithins has recently been developed in Riedel's laboratory, in which it was shown that in the degree that the products approach chemical identity, the properties of the lecithins are completely changed. The solubility in the ordinary solvents is in general more difficult, while the crystallizability is materially enhanced; that is to say, products are obtained which are more susceptible to purification by the known methods than are the

ordinary amorphous lecithin mixtures.—Pharm. Ztg., lvii (1912), No. 29, 292; from Riedel's Ber., 1912.

Lecithin—Question of Solubility in Water.—In view of the interest that has in recent years been manifested in medicine and pharmacy concerning lecithin and its preparations, resulting in the endeavor to present it for internal exhibition in form of solutions, wines, and syrups, Dr. P. Salzmann has made a comprehensive inquiry to ascertain from the literature whether the assumption that lecithin from egg-yellow is soluble in water to form clear solutions is justified by the facts. According to the most recent researches, lecithin is a monaminophosphatid, containing for one atom of phosphorous one atom of nitrogen, and is composed of glycerophosphoric acid, cholin, and two fatty acids—probably stearic and palmitic or oleic. It is characterized by the latest writers (for example by Thierfelder) as presenting a plastic, wax-like mass, soluble in alcohol, ether, chloroform, carbon disulphide, benzol, and fixed oils, but simply swells up in water, forming a pasty mass which when greatly diluted, forms a colloidal solution. It is therefore regarded by the author mentioned, and by others who have made comprehensive studies of the subject, as being an "organic colloid," capable of suspension in water so as to produce an apparent solution, but readily precipitated from such suspension by many substances, such as acids, metallic salts, etc., and even by alcohol, which by itself dissolves lecithin readily and completely. To meet a demand for water-soluble lecithin, such a preparation has recently been introduced under the name of "water-soluble egg phosphatid." Examined by R. Cohn, this product was found to contain sodium chloride, glycerin, nitrogenous matter, glycerophosphoric acid and water, but not a trace of lecithin. This product is therefore in no sense a lecithin preparation, nor are the solutions, syrups and wines that are made from it.—Pharm. Ztg., lvii (1912), No. 14, 134.

Lecithin—Method of Emulsionizing.—J. C. Schippers recommends a new method for preparing lecithin emulsions, which consist in dissolving the lecithin in a little toluol, shaking this solution with the desired quantity of salt solution, and then eliminating the toluol by passing a current of hydrogen through the emulsion produced. The author also describes a new practical method for lecithin determination, which may be consulted in the original paper, in Biochem. Ztschr., 40 (1912), 189-192.—Pharm. Ztg., lvii (1912), No. 37, 372.

Lecithin and Phytin—Pharmacology.—Dr. W. Bain observes that clinical experiments show lecithin to be a valuable drug for anæmia and debility. It probably acts as a metabolic stimulant, since it is hardly possible that a small amount of extra nitrogen and phosphorus administered in doses of a few grains daily can act as a tissue former to any substantial degree. Its beneficial effect on the nervous system is secondary to improvement in the general condition and not because lecithin is a "brain food." Its most striking effect is seen in the blood. The red corpuscles, white corpuscles (especially the lymphocytes) and the hæmoglobin percentage are all increased, as shown by experiments on rabbits. Although there is some evidence to show that phytin, inositol phosphoric acid ester, is an important phosphorized constituent in vegetable tissues which may be of value to herbivora, the evidence in favor of its utilization by the carnivora or man is negative or conflicting. Experiments with rabbits have not been sufficiently favorable to warrant its clinical use. The enzyme phytase, which decomposes phytin in plants, does not appear to occur in animals. Such decomposition as occurs in the animal organism, according to Plimmer, is due to the phytase ingested with the phytin.—*Pharm. Journ. and Pharmacist*, April 20, 1912, 511; from *Lancet*, 182 (1912), 918.

Blood—Chemical Detection, Especially in Blood-Stains.—Professor Edward Schaer communicated a short paper to the British Pharmaceutical Conference in which he draws attention to the existence of several older and newer absolutely correlative chemical reactions which, under the same conditions, invariably give analogous results in the presence of blood, and also the means of easy and thorough solution of blood in blood-stains. For the detection of blood he mentions that of the many reactions that have in the course of time been proposed, almost all are based on that curious quality of the coloring matter of blood, for the first time thoroughly studied by Schoenbein, to act in a catalytic way like a "peroxydase" upon hydrogen peroxide in presence of certain oxidizable substances readily forming some deeply colored oxidation products, and the author mentions and describes five reactions coming under this head.

Regarding the different methods for extracting blood from blood-stains that have been proposed, Professor Schaer says that after an experience of many years he is convinced that no dissolving liquid is more adapted to this purpose than a concentrated solution of chloral hydrate (70 to 80 per cent.)—*Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy)*, 1912, 533-535.

Hæmin Crystals—New Micro-Chemical Test.—Nippo finds that the following reagent affords a ready and certain means for obtaining the characteristic hæmin crystals for the detection and identification of bloodstains: Potassium bromide, 0.1 Gm.; potassium iodide, 0.1 Gm.; potassium chloride, 0.1 Gm.; glacial acetic acid, 100 Gm. A drop of the solution of the stain in this reagent is placed on a micro-slide, covered with a cover-glass, and warmed until bubbles just form. As it cools the hæmin crystals can be watched under the microscope, and after draining or evaporating the excess of liquid, and drying the residue, the crystals may be permanently mounted in Canada balsam.—Pharm. Journ. and Pharmacist, Dec. 28, 1912, 811; from D. Med. Wschr, 1912, 2222.

Commercial Proteins—Suitability for Pharmaceutical Purposes.—In a paper read before the British Pharmaceutical Conference, 1912, F. W. Crossley Holland calls attention to the more extended use during the last few years of protein substances in various connections, and that at the present time, judging by the attention which is being paid to the properties and possibilities of these substances, we are brought to realize that the near future will probably witness a much wider utilization of the various commercial proteins now offered on the market. The arts have profited by the investigations of proteins, inasmuch as a good deal of this work has resulted in its practical application to the production of preparations into which protein substances largely enter. This wide employment of protein substances in the arts has led to the inquiry into their suitability for extended employment in pharmacy; and while pharmaceutical uses of proteins are at present restricted, there is every indication of a more extended use owing to the greater interest which is being shown in protein foods and protein compounds of therapeutic and pharmaceutical significance, and prescriptions of the present day support this view. Natural difficulties and disadvantages probably account for the comparatively small position which proteins have hitherto held in pharmacy; but difficulties apart, there is a real and increasing call from the progressive fraction of medical men for pharmaceutical protein products, and the author's description of the nature and characters of the available products is therefore both timely and valuable. It must suffice here to simply mention the proteins discussed by the author, these being both of vegetable and animal origin, leaving the detailed description for consultation in the original.

The Vegetable Proteins offering pharmaceutical interest are represented by wheat protein, soya bean protein, and castor oil bean protein. There exist also proteins prepared from various leguminous seeds, but these have no particular interest other than as adulterants of higher priced proteins.

The Animal Proteins which claim pharmaceutical interest are: Egg-albumin, gelatin, serum-albumin, and milk-casein. Animal proteins have found a limited use in pharmacy as emulsifying agents, but—notably the milk casein—are capable of greater use in pharmacy.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1912, 489-494.

Proteins and Amido Acids—Action of Light and Hydrogen Peroxide.—J. Effront observes that the changes which the proteins and amido-acids undergo by the photochemical action of light are similar to those caused by proteolytic bacteria and aminases. The action of sunlight is due in the first place to the formation of hydrogen peroxide, which in time completely decomposes the protein molecule with formation of ammonia and nitrates. In alkaline solution hydrogen peroxide acts on proteins and amino-acids at the boiling point and completely removes the amino-groups—97-99 per cent. of the nitrogen is found as ammonia in the distillate, the remainder being present in the residue in the form of nitrates. The primary products of the reaction are ammonia and oxyacids, the latter then being more or less completely oxidized to volatile fatty acids and oxalic acid.—Pharm. Journ. and Pharmacist, Aug. 3, 1912, 159; from Compt. rend. 154 (1912), 1111.

Proteolytic Ferments—Action of Light.—The action of both visible and ultra-violet rays of light has been tried by H. Agulhon on yeast sucrase, malt amylase, pancreatic amylase, emulsin, pepsin, rennet-ferment, catalase, laccase, tyrosinase, and malt peroxidase. He finds that ultra-violet rays not only destroy micro-organisms, but they rapidly destroy all the ferments named, provided these are present in media which are permeable to the rays. Sucrase, laccase, and tyrosinase are only attacked by visible light rays in presence of active oxygen, and are less rapidly destroyed by ultra-violet rays in the absence of that element. Emulsin and catalase are decomposed, *in vacuo*, by all light rays, but less actively without than in the presence of oxygen. Rennet ferment is unaffected by ordinary light, but is destroyed by ultra-violet rays with equal rapidity in presence of oxygen and *in vacuo*.—Pharm. Journ. and Pharmacist, Aug. 31, 1912, 295; from Annales Inst. Pasteur, 26 (1912), 38.

Kefir-fungus—Conservation.—Dr. W. Schurmener describes a method for the conservation of the living kefir-fungus in a dormant condition, which consists simply in placing them into a concentrated sugar solution, whereby all growth or other change of the fungus may be prevented indefinitely. When required for use, the fungus so preserved is removed from the sugar syrup, washed with cold water, and immersed several days in boiled milk at 17° to 20° C., whereupon the fungi will be fully restored to their original activity. The author, furthermore, gives a description of a method for the preparation of kefir-milk in the household, pointing out the conditions that must be observed to obtain a satisfactory product.—Pharm. Ztg., lvii (1912), No. 97, 277.

Yoghurt-Glycobacterium—A New Milk Ferment from the Intestines of the Dog.—Dr. Piorkowski describes under the name of yoghurt-glycobacterium, a new milk ferment, discovered by Metschnikoff in the intestinal flora of the dog, which he believes to be destined to find favor for the preparation of a new sour milk possessing certain advantages over ordinary yoghurt-sourmilk. The new bacterium possesses saccharifying properties and is therefore, according to Metschnikoff, calculated to prevent or retard the formation of indol and scatol, the two powerfully poisonous bodies which are found in small amounts in the large intestine and are held responsible for the senile degeneration of man. In ordinary yoghurt there are three kinds of bacteria, namely *Bacillus bulgarius*, which is the most important, since it has the function of destroying the putrefactive bacteria existing in the intestines, replacing them and forming lactic acid, and two others, consisting of *B. diplococcus* and *B. strepto-coccus*, which exercise the subordinate function of decomposing the sugar in the intestines. These several bacteria exert a more intense activity in the presence of an abundance of sugar, and it is therefore recommended (and the practice) to administer the yoghurt in connection with saccharine food, such as dates or bananas. The sugar so provided is, however, almost entirely consumed before it can pass from the small into the large intestine, hence the advantage of the simultaneous administration of yoghurt-glycobacterium, which reaches the large intestine and there exerts its saccharifying action—producing the sugars necessary for the *Bacillus bulgarias* to exert its function to retard or prevent the formation of indol and scatol in it. Dr. Piorkowski's investigations demonstrate that this new "microbion" consists of immobile, ovoid, gram-negative bacilli, developing at as low a temperature as 22°-35° C. a rose-red to pale red metabolic product,

which imparts a fine color to wafers, bread, rice, potatoes and flour, but is destroyed at higher temperatures. Milk is coagulated by it at 37° C., and at lower temperatures acquires a light rose-yellow color. The taste of the milk so produced is sweetish. In combination with yoghurt an agreeably-tasting sour milk is produced which symbiotically combines the glycobacterium with the bacteria ordinarily present in the yoghurt.—Pharm. Ztg., lvii (1912), No. 87, 876.

Enteric and Pancreatic Ferments—Action on Chemical Organic Compounds.—From experiments performed by means of powdered enteric and pancreatic extracts, prepared *in vacuo* according to Choay's method by the cold process from the respective organs, E. Gérard and J. Leroy find that enteric extract contains ferments which are capable of decomposing esters, amides, anilides, ureides, nitriles, oximes and imides. These react when used alone, as well as when combined with pancreatic enzymes. The reaction occurs with fair rapidity, *in vitro*, and may generally be detected after three hours' contact. In the case of salol, salophen, cresalol, and betol, reaction readily occurs; a pure enteric extract exerts a more powerful action than a mixture containing both enteric and pancreatic enzymes. Methyl salicylate, benzonaphthol, and guaiacol, are equally hydrolyzed by both; so are acetamide, oxamide, succinamide, lactamide, lactophenine, benzamide and salicylamide. Formanilide, acetanilide, methylacetanilide, phenacetin and propylacetanilide, are decomposed both by the enteric ferments alone, and mixed with those of the pancreas; but isopropylacetanilide is not affected by either. Oxanilide is decomposed and oxalic acid liberated; the same acid is slowly set free from oxaluric acid. Acetonitrile, succinonitrile, lacticnitrile, acetaldoxime, benzaldoxime, and succinimide are all hydrolyzed by the simple or mixed extracts.—Pharm. Journ. and Pharmacist, April 20, 1912, 511; from Journ. de Pharm. et Chim., 1912, 329,

Enzymes—Descriptive Definition.—An editorial (J. Am. M. Assoc., 1912, v. 59, p. 282), points out that enzyme and substrate, according to Fischer, bear a relation to one another like that of a key to its lock. Not all keys will open all locks. The configuration of the two factors must be appropriate. Decidedly forceful and unquestionably unique is the description of the distinctive peculiarity of enzymes lately published by the London physiologist, Professor Halliburton, in a primer intended for the general reader. "We may roughly compare an enzyme," he writes, "to an ill-dis-

posed person who comes into a room full of good-natured people, and who succeeds in setting them all by the ears. He has produced a change in them without undergoing any change himself, by his mere presence. He is, moreover, able to repeat the process over and over again in fresh roomfuls ad infinitum." Perhaps the expression "enzyme" will now acquire a wider usefulness as a descriptive term for a not entirely unknown type of human being. (M. I. W.)

Emulsin—Synthetizing and Hydrolyzing Action.—Continuing their investigation of the synthetizing action of emulsin, E. Bourguelot and M. Bridel find that the ferment is capable of bringing about the direct combination of ethyl alcohol and glucose. When emulsin was constantly agitated in alcohol (85%) in presence of glucose for twenty days in a mechanical agitator, so that fresh particles of the ferment were constantly brought into contact with the solution, as much as 77.8 per cent. of the glucose present was converted into β -ethyl-glucoside. Further experiments show that this can be converted into the stereoisomer α -ethyl-glucoside, by action of hydrochloric acid. A similar combination takes place with other alcohols and glucose in presence of emulsin. Glucosides of methyl, propyl, isopropylbutyl, and isobutyl alcohols, have been obtained, and these compounds are again hydrolyzed by emulsin in aqueous solution.—Pharm. Journ. and Pharmacist, July 27, 1912, 99; from Journ. de Pharm. et Chim., 1912, 6, 13.

Emulsin—Reversible Reaction.—Seven years ago Visser found that when emulsin was allowed to react, in an aqueous medium, with saligenin and glucose, a product was formed which was regarded as almost certainly salicin, although its identity was not fully established. E. Bourguelot and M. Bridel, having now shown that emulsin, in the presence of alcohol 85 per cent. is capable of hydrolyzing 54 per cent. of any salicin in solution, it was considered probable that the reverse action in the same medium would give a better yield than water, as in Visser's experiment. This was found to be a fact, and the optical deviation attained in fourteen days was in accordance with theory. On removing the alcohol, and evaporating the residue to dryness *in vacuo*, then extracting the dry residue with water-saturated acetic ether, a method which was found capable of removing salicin from a mixture of saligenin and glucose, a glucoside was dissolved out. It was not salicin, however. It was a transparent amorphous hard mass, without a trace of crystalline structure, very soluble in water; n_D^{20} —30° 02; not reducing Fehling's reagent; rapidly hydrolyzed by emulsin, without regenerating sali-

genin. It has not yet been definitely identified, but the above characters are those of Koenig and Knorr's β -ethyl glucoside. In any case, it is established that emulsin is capable of a reversible activity, and to a greater degree than has hitherto been considered possible.—*Pharm. Journ. and Pharmacist*, Aug. 3, 1913, 160; from *Compt. rend.* 154 (1912), 1375.

Pepsin—Controversy Regarding Pharmacopæial Assay Processes.—Two notable papers on the assay of pepsin have recently been published in the "Bulletin de la Société Royale de Pharmacie de Bruxelles," one by Dr. A. Schamelhout, who was Secretary of the International Congress of Pharmacy held in Brussels in 1910, the other by M. G. Kottenhoff, a Belgian pharmacist. Mr. Thomas Maben mentions that these papers are the latest installment of a discussion that has been carried on for some months in the columns of the Belgian pharmaceutical press, and that this discussion had its origin in a paper by M. Hercod and himself, (see Proceedings 1911) which was read at the Brussels Congress, and in which they gave a detailed account of the various standards adopted for pepsin in different European Pharmacopœias, and of the methods of assay. In the course of their paper they drew special attention to the fact that the process described by the Belgian Pharmacopœia for the testing of pepsin was unworkable, this apparently being due to the specification of too weak hydrochloric acid instead of the absolute HCl required to carry out the test, while, in addition, too short a time is allowed for the digestive process. This paper gave rise to a considerable amount of controversy in Belgian pharmaceutical circles. Now, in the course of both articles referred to, full acknowledgement is given to Hercod and Maben, and frequent quotations are made from their report. It is gratifying to find an entire consensus of opinion regarding the conclusions arrived at in this report. Mr. Maben has little doubt that this controversy will bear fruit, not only in Belgium but elsewhere, for it is not creditable that an important article of *Materia Medica* like pepsin should vary to such an extent as it is bound to do under the very different conditions under which the Pharmacopœia tests are carried out.—*Chem. and Drugg.*, July 27, 1912, 152.

Papain—Determination of the Digestive Value.—J. R. Rippetoe submits the following method as a means of determining the digestive power of papain:

Prepare egg albumen as directed under pepsin assay U. S. P. 8th revision. Introduce into a 4-ounce wide-mouthed flint bottle 40

Cc. of a 0.1 per cent. sodium hydroxide solution and add 10 Gm. of the disintegrated albumen; stopper the bottle and shake vigorously until the albumen is broken up.

Then add the papain in fine powder and mix by shaking 15 seconds. Place the bottle in a water bath previously heated to 52° C. and digest at this temperature for 6 hours, removing bottle every 10 minutes and shaking gently for 15 seconds. At the end of this period, transfer the mixture to a 100 Cc. grad. stoppered cylinder, rinse the bottle with water, add rinsings to the mixture and make the volume up to 70 Cc. with water.

Allow to stand for one hour, then read off volume of the deposit, take second reading after standing 16-18 hours, which seems to give more positive results.

It was found that some digestion took place in 0.1 per cent. HCl but that 0.2 or 0.3 per cent. HCl inhibits the action.—Journ. Ind. and Eng. Chem., July, 1912, vol. 4, p. 517. (L. A. B.)

Diastase—Instability of Preparations Containing this Ferment.—In a discussion at the Société de Thérapeutique de Paris Chevalier stated he had found the activity of the diastasic ferment of malt, of malt extract, and of malted flours to be very prone to deterioration. Linossier confirmed this statement. He had examined a number of pharmaceutical specialties, such as maltines, pepsins, and pancreatins, and as a rule found no trace of diastase. Although the article may have been active at the time of preparation, it had rapidly lost its diastase power in the mixture in which it occurred. Chevalier found that dry malt extracts, or pastes, prepared at a low temperature retained their diastasic activity better than other preparations. The importance of employing in medicine only freshly prepared articles the efficacy of which is dependent on enzymes was insisted on. At the best, these ferments are not very stable.—Pharm. Journ. and Pharmacist, Feb. 17, 1912, 199; from Journ. de Pharm. et Chim., 1912, 5, 92.

Rennet—Action on Milk.—In the manufacture of Cheddar cheese, retardation of the time of coagulation has often been remarked, notwithstanding the acidity had been of the required degree before the addition of the rennet to the milk. The investigations of M. Nierenstein and J. Stubbs show that the acidity of the milk is not due entirely to lactic acid, but partly to some product originating from caseinogen, and that though this is stimulated by the addition of lactic acid, pure lactic acid is of no use as a starter. Furthermore, the authors find that the retardation of the time of coagulation with rennet is not entirely dependent on the calcium

salts.—Pharm. Journ. and Pharmacist, Aug. 17, 1912, 233; from J. Agric. Sci., 1912, 4, 371, through Journ. Soc. Chem. Ind., July 15, 1912, 657.

Rennin—Laboratory Studies.—In a study of the properties of rennin, prepared by different methods, A. Zimmerman states that rennin prepared by precipitation with sodium sulphate has a strength of 1:30,000 to 1:40,000 in 12 min., while that prepared with sodium chloride 1:150,000 to 1:200,000 in 12 min.

Scale rennin prepared with a strength of 1:30,000 to 1:40,000 is prepared by scaling the clarified solution of the whole rennets at a temperature not exceeding 110° F.

Commercial rennin comes in two forms: (1) Powdered, prepared from the Na Cl product and diluted with sugar of milk to test 1:30,000 to 1:40,000 in 12 min.; (2) Granular rennin, prepared from the scales and which tests the same as the powdered.

The permanency of the rennin in solution seems to be dependent upon phosphoric acid, which probably exists in the rennets as a calcium salts.

The addition of .075 per cent. of phosphoric acid to milk greatly increases the activity of the rennin, much more so than lactic, hydrochloric, or oxalic acids.—Journ. Ind. and Eng. Chem., July, 1912, vol. 4, p. 508. (L. A. B.)

Trypsin—Measurement of its Relative Activity.—A. R. Smith observes that the standardization of trypsin, to the presence of which enzyme pancreatin owes its proteolytic properties, is of importance both from medicinal and commercial points of view. The tryptic activity of a substance is shown by its action on some protein substratum, such as a slightly alkaline solution of casein or egg albumen under certain conditions. The author finds the method of Sorensen as being best adapted for this purpose, since by its use it is possible to follow the course of proteolysis by titration, and has applied this method to measure the relative activity of pharmaceutical preparations. The method as carried out upon five samples of pancreatin obtained from well known manufacturers, and also on two samples of "trypsin," is described in detail, and the results exhibited in the form of a table plainly indicate its utility for the purposes of standardization.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy) 1912, 525-532.

Colloids in Medicine.—Prof. Dr. H. Bechold read a highly scientific paper on this subject at the jubilee meeting of the Verein Deutscher Chemiker at Freiburg. Besides colloids and crystalloids

and their solutions he also spoke on the ultramicroscope, by which particles of one-one hundred thousandth of a millimeter can be seen, and the ultrafilter with pores of one-five hundred thousandth of a millimeter. The theory of electrolytic dissociation and osmotic pressure has also been utilized in a practical manner in biologic, especially in uric acid diathesis.—Ph. Post, 1912, No. 47, 494. (O. R.)

Gelatin—Impurities.—J. G. Roberts remarks that quite a frequent source of impurity in gelatin is the presence of sulphites, which are probably present as the result of the use of sulphur dioxide as a bleaching agent, although it has been claimed by some manufacturers that its presence is necessary as a preservative during the process of manufacture. While sulphites have been found in the majority of samples examined, it is usually there in very small quantities, sometimes only a trace. The term "technical" which is found on many packages is probably placed there because of this impurity. His examination for arsenic developed the fact that in some samples of German manufacture it was detected and therefore he thinks it advisable to test supplies of gelatin from this source.—Proc. Penn. Pharm. Assoc., 1912, pp. 310-312. (E. C. M.)

Gelatin—Occurrence of Arsenic in Commercial Sorts Sold for Food.—Dr. O. Köpke mentions that the skins used in the preparations of leather, especially of white glacé leather, are often treated with lime and arsenic sulphide. As the refuse, clippings, etc., of leather are used for the manufacture of gelatin, it was of importance to find out whether the arsenic was removed in the process of tanning. Examination of white glacé gloves showed the presence of arsenic, and the author proceeded to test twelve different samples of gelatin which were sold for use in the preparation of articles for human consumption. Ten grammes of the sample were placed in a 700 Cc. flask and dissolved in 20 Cc. of concentrated sulphuric acid and about 50 Cc. of fuming nitric acid, the latter being added gradually. The excess of nitric acid was removed by evaporation, and the liquid tested for arsenic by the Polenské process in a Marsh's apparatus. In every sample arsenic was present, although in some cases the quantity was not sufficient to be weighed.—Pharm. Journ. and Pharmacist, March 23, 1912, 387; from Arbeit. a. d. Kais. Gesundheitsamte, xxxviii, 3, 290.

Keratin—Poor Quality of Commercial.—Puckner, W. A., reports that a sample of keratin examined by him was found to be almost completely (98.73 per cent.) soluble in hydrochloric acid-pepsin so-

lution, and apparently no satisfactory product is being marketed at the present time.—J. Am. Med. Assoc., 1912, v. 59, p. 1157. (M. I. W.)

Animal Organs—Toxicity of Extracts Made from Some.—C. Bianchi finds that intravenous injection of aqueous extract of normal rabbit lung is toxic to rabbits, rapidly causing death, with intense spasm, opisthotonos, apnoea, and paralysis, even with only a small dose of between 0.05 to 1 mill per 2 kilo body-weight. Lung extract has a similar poisonous action on other animals. With guinea-pigs the effects do not appear so rapidly, but are accompanied by a marked fall of temperature. The toxicity of lung extract is not modified by contact with sera, with leucocytes, or with aqueous extracts of other organs. Injection of a small dose induces a certain immunity to further doses, so that in the space of a few minutes eight or ten times a normally fatal dose is tolerated. This resistance, however, is of short duration, not lasting more than forty-eight hours. Extract of thymus gland has a distinct toxic action. Spleen extract only shows a very slight and variable toxicity.—Pharm. Journ. and Pharmacist, May 11, 1912, 607; from *Patologica*, 3, 59 and 61, through *Nouv. Remèdes*, 29 (1912), 151.

Thyroid Gland Preparations.—An editorial (J. Am. Med. Assoc., 1912, v. 59, p. 1980), points out that the products available in the form of dessiccated thyroid are derived from several of the slaughter house animals, notably sheep, and the commercial preparations are frequently standardized in terms of their content of iodine. The glands of hogs are usually richest in iodine and their selection for therapeutic purposes appears decidedly rational, at least, so far as known, there is no occasion to reject the hog products. (M. I. W.)

Thyroid Glands—Iodine-content.—N. H. Martin reports the results of a long series of determinations of the iodine content of thyroid glands which have been carried out during the past year by his principal chemist, Mr. Binks. These results are exhibited in a table giving the dates, number, weight of fresh lobes (average and total), weight of dried thyroid, average yield, iodine in the dry and the fresh thyroid and the average iodine per lobe—over 6500 lobes having been used in the course of these determinations, and the figures in each estimation being based on the bulked product of some hundreds. This is regarded a very important point, as the iodine content of *thyroidum siccum* from single glands varies more than the milk obtained from individual cows, and it is obviously as

inadvisable to talk of fixing a standard from assays of a few glands as to fix a milk standard from analyses of milk obtained from a few animals instead of from herds. The B. P. does not include limitation figure for size of gland, but "hypertrophied or otherwise abnormal" glands are directed to be rejected. It is difficult to see how the average pharmacist can be expected to discriminate. Sheep's thyroids vary greatly in size, but anything between 1 in. and 2 in. in length may be said to be usual. Frequently glands are met with which greatly exceed these proportions, though apparently of healthy enough tissue. Such lobes were always discarded, but the following figures are of interest:

Weight of Lobe	Weight of Dry Thyroid obtained	Iodine in Dry Thyroid	Iodine per Lobe
Grams	Grams	%	Gram
12.0	2.8	0.22	0.00616
14.0	3.3	0.20	0.00660
32.5	7.5	0.08	0.00600

It is noteworthy that while large lobes contain much more iodine than usual, it is not proportionate to their increased weight, and the percentage of iodine in the dried substance is reduced. The author states that the iodine in

Liquor Thyroidei, B. P., varies from 0.01 to 0.03 Gm. per 100 Cc., but that apparently only half the iodine in the glands is extracted.—Trans. Br. Pharm. Conf. (Yearbook of Pharmacy), 1912, 408-410.

Epinephrine from the Whale.—An editorial (J. Am. Med. Assoc., 1912, v. 59, p. 2263), calls attention to a paper by Weidlein on the adrenal glands of the whale, which were found to be about five hundred times as large as the corresponding glands of sheep and fifty times as large as the glands from cattle. The yield of epinephrine is proportional to that hitherto obtained from other animals, so that as much as 1.2 Gm. of the typical active principle has been isolated from a single whale adrenal gland. (M. I. W.)

Meat—Distinction Between Frozen and Fresh.—To the food chemist this is frequently very important. L. Sobel finds no difference in food value, but in the water content which is 50 per cent. or less in frozen meat and 53 to 75 per cent. in fresh meat.—Schw. Woch. (O. R.)

Bile—Detection in Stomach Contents.—The following method, based upon the oxidation of biliverdin with nitric acid, forming green biliverdin, is recommended by Dr. Goodall as being delicate

and easy of application. Half a test-tubeful of the fluid portion of the stomach contents is taken. If this amount cannot be obtained, or if the contents consist largely of solid material, it should be diluted with water, thoroughly mixed and the fluid portion poured off or filtered. The fluid is then saturated with ammonium sulphate. Then from 1 to 3 Cc. of acetone is added, and the whole thoroughly mixed by inverting the test-tube five or six times. It is best not to shake. After standing a minute or two the acetone rises to the surface of the fluid, carrying bile pigment up with it. A drop of yellow nitric acid is allowed to run down the side of the test-tube and the green reaction occurs in the acetone layer. Care should be taken in adding the acid, as too large quantities produce too rapid an oxidation and the green quickly passes over into a purple or reddish color.—*Boston Med. and Surg. Journ.*, March 20, 1912, 487.

Cholesterin—Chemistry.—A. Windaus states that the cholesterin molecule can be broken down by means of heat as well as by oxidation. It is, however, very stable at temperatures below 300° . The acid $C_{27}H_{44}O_4$, when heated to 280° - 300° under reduced pressure, gives off carbon dioxide and water yielding the ketone $C_{26}H_{42}O$. The acid $C_{25}H_{40}O_6$, also obtained from cholesterin, when heated in the same way yields water, carbon dioxide, and a keto-monocarboxylic acid $C_{24}H_{38}O_5$. This acid is readily oxidized by chromic acid or nitric acid to a tricarboxylic acid $C_{24}H_{38}O_6$, which crystallizes in long thin prisms and melts at 216° . When heated it forms a monobasic acid melting at 170° , which crystallizes from acetic acid in fine long prisms.—*Pharm. Journ. and Pharmacist*, July 6, 1912, 7; from *Ber. d. D. Chem. Ges.*, 45 (1912), 1316.

Cholestrin—Property of Promoting the Miscibility of Water with Fatty Bases.—Dr. P. Siedler directs attention to property of cholestrin to materially increase the miscibility of water with fats and ointments. The addition of 10 per cent. of cholestrin to lard, cerate, vaselin and liquid paraffin permits an admixture of over 200 per cent. of water, forming handsome, creamy ointments of extraordinary smoothness and pliancy. It fails, however, to increase the absorbability of water by wool fat.—*Pharm. Ztg.*, lvii (1912), No. 29, 292; from Riedel's *Ber.*, 1912, 34-36.

Vaccines.—An editorial (*J. Am. Med. Assoc.*, 1912, v. 58, pp. 1687-1688) points out that this country is being flooded with preparations belonging to the general class of "vaccines, viruses, and anti-toxins," the value of which has not been definitely established, also calls attention to the possible misinterpretation of the phrases:

“Licensed by the Treasury Department,” “U. S. Government License No. —,” and “Guaranteed Under the Food and Drugs Act.” (M. I. W.)

Bacterial Vaccines—Characters and Preparation.—Introducing his subject with a reference to the revolution in medical practice caused by the successful use of such animal products as thyroid extract, adrenine, etc., Dr. Lan Struthers Stewart observes that bacterial vaccines, though not so well known, have a much wider field of usefulness than that of other organic substances, and they bid fair to oust all other remedies in the treatment of diseases of bacterial origin. Two types of vaccines are used, autogenous and stock, the former being made from the organism causing the patient's disease, and the latter containing several strains of one bacterium cultivated from different sources. The balance of opinion seems to be in favor of the autogenous vaccine. It is usual in cases of extreme urgency to use an appropriate stock vaccine for the first inoculations, the minimum time for the preparation of an autogenous vaccine being from twenty-four to forty-eight hours. Stock vaccines of staphylococci are very satisfactory on the whole, though occasionally a case is met with where an autogenous vaccine is necessary. On the other hand, with *Bacillus Coli* it is usually necessary to prepare a fresh vaccine for each case. The first step towards the preparation of a vaccine is the collection of material from the patient. This may consist of blood, pus, sputum, urine, or fæces, but it must be collected with strict asepsis. It is important that, whenever possible, the vaccine should be made from a primary virulent culture, and as in a general way an organism on sub-culture becomes less virulent, it is essential to keep as near to the primary culture as possible. Every care must be taken to make sure that the true cause of infection be found. The author describes the methods of preparing vaccine and of the bacterial emulsion in detail, which vary according to conditions and kind, and gives also the methods employed for their standardization and sterilization. These vaccines are generally supplied in small glass capsules, hermetically sealed, and labeled with the number of organisms contained in 1 Cc. of the emulsion.—Trans. Brit. Pharm. Conf. (Yearbook of Pharm.), 112, 422-428.

Filterable Viruses—Nature.—An editorial (J. Am. Med. Assoc., 1912, v. 59, pp. 1459-1460), in commenting on a summary of the present status of our knowledge of the filterable viruses, points out that at the present time there are nearly thirty diseases of human, plant and animal life which have been demonstrated as being due

to such viruses. Of those which affect man there are foot-and-mouth disease, rabies, vaccinia, variola, yellow fever, molluscum contagiosum, dengue fever, verruca vulgaris, trachoma, sand-fly or three-days fever, poliomyelitis, typhus fever and possibly measles and scarlet fever. These filterable viruses are probably so small as to be practically invisible and pass through the pores of a Berkefeld or a Chamberland filter, which will retain even very small cocci. (M. I. W.)

Antidiphtheric Sera—Commercial Variation.—De Gottrau calls attention to a prescription received from an oculist of Lausanne calling for Roux's Antidiphtheric Serum 10 Cc. diluted with physiologic salt solution 100 Cc.; the mixture being used for infectious diseases of the eye. His article is to call attention to the fact that the sera prepared in Switzerland (Institute of Bern) are not identical in strength with the Roux sera and he gives the proportion of Swiss sera he used.—Schweiz. Wschr. f. Chem. u. Pharm., 1 (1912), No. 1, 11. (H. V. A.)

Diphtheritic Serum.—Perkins, M. J., reports the successful use of diphtheritic serum to control bleeding in a hemophiliac, no other horse serum being available.—J. Am. Med. Assoc., 1912, v. 59, pp. 1539-1540. (M. I. W.)

Tetanus Serum.—Berghausen and Howard discuss the treatment of wounds, with reference to tetanus prophylaxis. They report that in ninety-six cases properly treated locally by the prophylactic administration of antitetanic serum, not one patient developed tetanus. In fourteen cases treated without the prophylactic administration of antitetanic serum, eight patients developed tetanus, of whom six died.—J. Am. Med. Assoc., 1912, v. 58, pp. 104-105. (M. I. W.)

Tuberculous Sputum—Bacteriological Examination by the Antiformin Method.—Haass describes the rapid method of preparing tuberculous sputum for bacteriological examination by use of antiformin, which is the trade name for a mixture of solution of chromated soda and alkali. This mixture dissolves mucous, hair, wool, silk, nail tissue, keratin and is therefore an ideal fluid to dissolve the ingredients of the sputum other than bacteria. Moreover, while antiformin does dissolve some bacteria, the bacilli of tuberculosis are not dissolved; thus rendering its identification still easier. The manipulation consists of adding to 10 Cc. sputum 20 Cc. 10 per cent. antiformin, and after shaking, the mixture is warmed to 40° on water bath for one-half hour, or until completely homogeneous. Then add 5 Cc. ligroin, shake

vigorously and warm to 40° on water bath till the ligroin separates as clear layer, when a sample of the material at the point of contact of the two liquids is transferred on a platinum spatula to a cover glass and examined microscopically after staining. The article traces the history of the process and has a good bibliography.—Schweiz. Wschr. f. Chem. u. Pharm., 1 (1912), No. 12, 174. (H. V. A.)

Sputum—Clinical Tests.—Williamson, Charles Spencer, discusses the value of the Loeffler method of sputum examination. He describes and illustrates the technique and asserts that under ordinary laboratory conditions, this method will show tubercle bacilli in about 37 per cent. of sputa in which the organisms are so scarce as not to be demonstrable in the usual way.—J. Am. Med. Assoc., 1912, v. 58, pp. 1005-1007. (M. I. W.)

Urine—Rapid Method of Determining Urea.—Dr. J. A. Milroy describes a rapid method of estimating urea in urine, which is carried out in four stages: (1) Precipitation of the phosphates with baryta mixture, the mixture being made up so that the urine is finally diluted with an equal volume of liquid. (2) Determination of the pre-existing ammonia and amine derivatives in an aliquot portion (10 Cc.) of the filtrate of formaldehyde titration—using two indicators: methyl red for the determination of the neutral point, and phenolphthalein for the titration of the acid set free by the addition of the neutral formaldehyde. (3) Hydrolysis of the filtrate: portions of 10 Cc. (=5 Cc. of the original urine) of the filtrate are placed in test tubes covered with lead foil and heated in an autoclave with an equal volume of normal acid—HCl or H_2SO_4 —at $155^{\circ} C.$ for one and a half hours. (4) Determination of the ammonia and amine derivatives in the hydrolyzed urine by means of formaldehyde titration, using methyl red in determining the neutral point.

The result of step (4) *minus* the result obtained in step (2) gives the amount of urea expressed in cubic centimeters of decinormal alkali (1 Cc. N/10 alkali=0.003 Gm. urea.) present in 5 Cc. of the urine.—Pharm. Journ. and Pharmacist, Oct. 19, 1912, 487; from Brit. Med. Journ., Sept. 28, 1912, 791.

Chondroitin Acid—A Constituent of Normal Urines and Relation to Albumen.—H. Politzer states that a large number of normal urines when treated with acetic acid give a faint turbidity. This is due to the presence of chondroitin, or chondroitin acid, which, when rendered acid with acetic acid, gives a precipitate with the minute traces of albumen present in normal urine. The reaction is more

marked in cases of renal affections, but also occurs in certain cases in which it is practically of no pathological significance. It is rarely present in the absence of all trace of albumin, but its presence is easily indicated by treating the clear urine, or the bright filtrate after treatment with acetic acid, with a small quantity of serum albumen solution. Large quantities of albumen, however, hinder the reaction, and these must first be removed and the test applied to the filtrate.—*Pharm. Jour. and Pharmacist*, Dec. 21, 1912, 781; from *D. Med. Woch.*, 1912, 1539.

Uric Acid—Behavior.—An editorial (*J. Am. Med. Assoc.*, 1912, v. 59, pp. 545-546), points out that uric acid has long been a name of mysterious import in medicine—one of those terms which, to the scientific mind, means unsolved problems; to the unthinking individual it often serves as a veil to hide ignorance; for the quack and the nostrum maker, especially the manufacturer of ethical proprietaries, it has been a money maker. More recent investigation has shown that when uric acid or purins are given by mouth they are no longer recovered quantitatively in the excretions. They appear to be easily decomposed in the alimentary canal, and it is probable that the intestinal bacteria (notably those of the colon group) readily destroy the integrity of the purin molecule. (M. I. W.)

Allantoin—The Active Constituent of Comfrey.—At the request of Dr. C. J. Macalister, an investigation of the rhizome of the common comfrey (*Symphytum officinale*) was undertaken by A. W. Titherley and N. G. S. Coppin in order to ascertain, if possible, the constituent which was responsible for its remarkable therapeutic properties (see *Comfrey Rhizome* under “*Materia Medica*”). The results of their exhaustive investigation prove these properties to be due to a crystalline principle, which they have identified with allantoin, a constituent of urine, and obtainable synthetically by the oxidation of uric acid. The allantoin was obtained by soxhleting a number of portions of the coarsely powdered dried rhizome with alcohol to exhaustion, evaporating the separate extractions to about one-fourth the volume for weight of the drug used and setting the concentrated liquid aside for at least twelve hours, during which time an encrustation was formed, consisting of impure allantoin and sugar. This was removed and treated with a small quantity of water, the same being used successively on all the portions (six) so as to remove the sugar without appreciable loss of the sparingly soluble crude allantoin, which was recrystallized from hot water and

eventually obtained absolutely pure. It formed perfectly colorless and transparent crystals which melted at 227° with decomposition and gas evolution with previous darkening in color, and proved to be identical in every respect—in composition, characters, and reactions with allantoin obtained synthetically from uric acid by cautious oxidation, using Behrend's method slightly modified. The authors conclude that the rhizome of *Symphyllum officinale* contains allantoin to the extent of 0.6 to 0.8 per cent., calculated on the air dried material, and that the therapeutic properties of the rhizome are due to this constituent. It also contains large quantities, not estimated, of soluble carbohydrates (gums and sugars) together with catechu resins and tannins, and a small quantity of volatile oil.—Pharm. Journ. and Pharmacist, Jan. 27, 1912, 92-94.

Allantoin—Preparation.—In view of the attention which is at present focussed upon allantoin, the active constituent of *Symphyllum officinale*, W. Gilbert Saunders considers it worth while to discuss in some detail its synthetic formation by the method of Robert Behrend. The procedure is briefly as follows: Pure uric acid is dissolved in potassium hydroxide and is carefully oxidized with a 5 per cent. solution of potassium permanganate. The theoretical quantity of permanganate should be used, that is, one atom of oxygen to each molecule of uric acid. The process can also be carried out with the uric acid merely in suspension, but, in this case, a proportion of it remains unaffected, although the full amount of permanganate is decomposed. Dr. Titherley and Mr. Coppin employ a mechanical stirrer and keep the temperature at 10° C. As soon as the oxides and hydroxides of manganese are completely precipitated, the mixture is filtered at the pump. Excess of acetic acid is then added and the solution heated to boiling. On cooling, or at any rate after a few hours, most of the allantoin crystallizes out in a pure state. If the heating is not resorted to after the acidification, the separation of allantoin is extremely slow and is not complete for several days. The remainder of the allantoin is obtained by concentrating the mother-liquid, but this second crop of crystals is not usually pure, and should be re-crystallized from hot water.—Pharm. Journ. and Pharmacist, Feb. 17, 1912, 197.

Urine—Colorimetric Determination of Uric Acid.—Prof. E. Riegler proposes a colorimetric method for the determination of uric acid, which depends on the blue color produced on treatment with phosphomolybdic acid and disodiumphosphate, and is carried out as follows: Into a graduated tube 1 Cc. of a 0.1 per cent. solu-

tion of uric acid is placed; into a second, 1 Cc. of the urine under examination, and into a third, 1.2 Cc. of the same urine, from which the uric acid has previously been removed by means of ammonium chloride. Then 2 Cc. of a 10 per cent. solution of phosphomolybdic acid is added to the contents of each tube, shaken, and filled accurately to the 10 Cc. mark with disodium phosphate solution. After mixing, the contents of the tubes are heated until small gas-bubbles begin to appear, when they are immediately transferred into a beaker filled with cold water. On cooling, the colorimetric determination is then effected in the usual manner in a colorimeter.—Pharm. Ztg., lvii (1912), No. 56, 563; from Ztschr. f. anal. Chem., 1912, No. 7 and 8.

Urine—Source of Error in Trommer's Sugar-Test.—In accordance with the directions for carrying out Trommer's test for sugar in urine, a fairly concentrated solution of sodium hydroxide is added, followed by the careful addition of cupric sulphate, so long as the cupric hydroxide is redissolved, whereupon the liquid is heated until it begins to boil. Professor N. Schulz finds, however, that if the addition of the reagents is reversed, two periods arise which are liable to lead to deception: the first, due to great solvent power of urine on cupric hydroxide, and the second, due to the liability of reduction by normal urine after comparatively short boiling. The author, therefore, warns against a deviation from the order of the original directions, for those who still prefer to operate by Trommer's method, but recommends as preferable the method depending on the use of Fehling's solution, or, better yet, Heine's modified solution.—Pharm. Ztg., lvii (1912), No. 15, 148; from Münch. Med. Wschr., 1912, No. 5.

Urine—Source of Error with Nylander's Test for Sugar.—Dr. E. Strauss has observed that certain substances interfere with the characteristic reaction for sugar by Nylander's test in the urine of diabetics (production of a black color or precipitate by the reduction of the alkaline bismuth solution to metallic bismuth). Among these he finds iodthion, which when administered passes into the urine and is liable to form a complex compound with the bismuth salt, which protects the bismuth from the reducing action of the sugar. The author, furthermore, finds that iodthion does not interfere with the reaction produced by glucose upon Fehling's solution.—Pharm. Ztg., lvii (1912), No. 15, 148; from Münch. Med. Wschr., 1912, No. 2.

Urine—Detection of Acetacetic Acid.—Béla v. Ondrejovich recommends the following method for the detection of acetacetic acid in urine, which is based upon the property of this acid of combining with iodine in acidified solution: To 5 Cc. of urine, acidulated with 5 drops of 50 per cent. acetic acid, solution of methylen blue (1:500) is added to produce a distinct blue color, one drop usually sufficing. On now adding 4 drops of tincture of iodine, the mixture assumes a red color; but in the presence of acetacetic acid the blue color is restored within at most one minute, or it turns green, whereas otherwise the red color is permanent.—Pharm. Ztg., lvii (1912), No. 64, 644; from D. Med. Wschr., 1912, No. 30.

Urine—Determination of Chlorides.—Elsewhere (see "Nitric Acid") some difficulties are pointed out in the determination of chlorides in urine by Sahle's method, owing to the persistent presence of chlorine (HCl) in the nitric acid supplied as pure by reputable manufacturers. In this connection a method proposed by Dr. Desider v. Balazsy is noteworthy, this consisting of the direct titration with standardized (2%) solution of AgONO_2 and potassium chromate as indicator. The color reaction is also found particularly useful for determining the chlorides in the urine of nursing infants in order to ascertain whether the milk is supplied from the mother's breast or by the bottle. To 5 Cc. of the urine, previously neutralized with ammonia, 2 drops of potassium monochromate are added, followed by 1 Cc. of 2 per cent. silver nitrate solution. If the NaCl content of 5 Cc. of the urine is below 0.0069 Gm., the precipitate turns red with 1 Cc. of silver solution, indicating breast nourishment; while, when the milk is supplied from the bottle, the reaction generally results in the negative.—Pharm. Ztg., lvii (1912), No. 21, 211; from Berl. Klin. Wschr., 1912, No. 8.

Urine—Quantitative Determination of Indican.—Dr. O. Sammet, of the Technical High School at Zürich, explains the formation of indican or potassium indoxylsulphate, which is contained in healthy urine from 0.006 to 0.02 per cent., and in pathogenic urine up to 0.3 per cent. He reviews the different methods of determining indican quantitatively, according to Obermeyer-Wang, Bouma, Strauss and especially according to Folin. The latter, which is extensively used in the United States, is a colorimetric method in which the color of the indigo-chloroform extract is compared with the one of Fehling's Volumetric Solution. Sammet enumerates the advantages and disadvantages of Folin's method and reaches the conclusion that for clinical purposes it is sufficiently accurate. For particulars

the original article should be consulted.—Ph. Zhalle., 1912, No. 22, 585-589. (O. R.)

Urine—Clinical Tests.—An editorial (J. Am. Med. Assoc., 1912, v. 59, p. 1725) calls attention to the possible fallacy of testing isolated samples of diabetic urine in place of testing all of the urine for twenty-four hours. (M. I. W.)

Urine—Critical Study of the Cammidge Reaction.—An editorial (J. Am. Med. Assoc., 1912, v. 59, p. 2264) calls attention to a paper by Matesima, who reports a critical study of the Cammidge reaction and points out that there is no uniformity in the character of the crystalline osazones obtained in the Cammidge reaction and that therefore this reaction is devoid of diagnostic significance for pancreatic disease. (M. I. W.)

Cammidge Reaction in Urine—Cause.—An editorial (J. Am. Med. Assoc., 1912, v. 59, p. 1630) discusses the cause of the Cammidge reaction in urine, and points out that the conclusions arrived at by different investigators are decidedly conflicting. An unbiased review of the situation, however, cannot fail to awaken a skeptical attitude in regard to the Cammidge reaction and to place it at best in the category of corroborative evidence. (M. I. W.)

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July 1, 1911, to January 1, 1913

DECEASED	RESIDENCE	ELECTED
Armour, Elmer E.....	Pomona, Cal.....	1909
Baird, Julian W.....	Boston, Mass.....	1894
Baldwin, Edward L.....	San Francisco, Cal.....	1909
Barnett, Joel J.....	Baltimore, Md.....	1899
BIROTH, HENRY.....	Chicago, Ill.....	1865
Boynton, Herschel.....	Biddeford, Me.....	1876
Brecht, Frederick A.....	Yankton, S. D.....	1895
Bridaham, Lester B.....	Denver, Colo.....	1910
Brierley, John H.....	Glasco, Kan.....	1910
<i>Colton, James B.....</i>	Boston, Mass.....	1865
Cramer, Max.....	Boston, Mass.....	1881
Daboll, Horace H.....	New London, Conn.....	1903
DeJongh, y Boudet Pedro.....	Marti Matz, Cuba.....	1907
Dedman, Richard.....	Arkansas City, Ark.....	1908
DOHME, CHARLES E.....	Baltimore, Md.....	1863
<i>Doliber, Thomas.....</i>	Boston, Mass.....	1859
Fleischner, Charles.....	New Haven, Conn.....	1905
Flowers, Hiland.....	New York, N. Y.....	1904
<i>Gale, William H.....</i>	Chicago, Ill.....	1857
Green, Edward T.....	New York, N. Y.....	1905
Hedegard, Hans C.....	San Francisco, Cal.....	1909
HEYDENREICH, EMILE.....	New York, N. Y.....	1867
Hitchcock, George H.....	New York, N. Y.....	1902
JACQUES, GEORGE W.....	South Amboy, N. J.....	1869
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Koegel, Herman H.....	Ironton, Ohio.....	1907
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<i>McPherson, George.....</i>	Chicago, Ill.....	1865
<i>Molwitz, Ernst.....</i>	New York, N. Y.....	1867
Muir, William.....	Brooklyn, N. Y.....	1907
Parker, Frank H.....	Burlington, Vt.....	1909
Rafter, Michael.....	New York, N. Y.....	1908
Raikes, Benjamin T.....	San Francisco, Cal.....	1912
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Richardson, Samuel W.....	Chelsea, Mass.....	1897
Robertson, Reuben D.....	Ft. Bayard, N. Mex.....	1912

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(List corrected to March 25, 1914.)

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1050 Lawton ave., Detroit, Mich.
- Wheeler, Carlton B.,
18 Main st., Hudson, Mass.
- Whelan, Wm. F.,
844 Ellicott Sq., Buffalo, N. Y.
- WHELPLEY, HENRY M., PH.G., M.D.,
2342 Albion Place, St. Louis, Mo.
- Whipple, Mathew,
506 4th ave., Maywood, Ill.
- Whitaker, Wm. H.,
102 Ferry st., Malden, Mass.
- White, Edw. R.,
Main st., Salisbury, Md.
- White, Forest E.,
Sergt. 1st Cl., H. C., Ft. Porter,
Buffalo, N. Y.
- White, Jennie Maguire,
416 Hayes st., San Francisco, Cal.
- White, Joseph L.,
207 Southern Bldg., Washington, D.C.
- White, Robert W., Ph.G.,
5601 Lansdowne av., Philadelphia, Pa.
- White, Wm. R., Ph.C.,
311 Grace st., Nashville, Tenn.
- Whitehead, Bower T.,
Brookings, S. D.
- Whitmore, Geo. C.,
601 Harrison ave., Leadville, Colo.
- Whitney, David V., Ph.G.,
4342 Campbell st., Kansas City, Mo.
- Whitney, Minne M. (Mrs.),
714 Wyandotte st., Kansas City, Mo.
- Whittle, Wm. A.,
308 W. Lombard st., Baltimore, Md.

- Whittlesey, Henry H.,
240 E. Center st., Pocatello, Idaho.
- Whitworth, Charles Bell,
1134 Jefferson st., Nashville, Tenn.
- Whitworth, Frank E.,
775 2d S st., Salt Lake City, Utah.
- Whorton, Carl,
5th & Chestnut sts., Gadsden, Ala.
- Wicarius, Max J.,
4900 W. 29th st., Cicero, Ill.
- Wich, Henry E.,
1230 W. Stricker st., Baltimore, Md.
- Wicker, Judson A.,
30 Garden st., Roslindale, Mass.
- Wickett, Francis Wm., S.H.C., U.S.A.,
Post Hosp., Jefferson Barracks, Mo.
- WICKHAM, Wm. H.,
91 Fulton st., New York, N. Y.
- Wiggin, Harry C.,
14 Fulton st., Boston, Mass.
- WILBERT, MARTIN I.,
1621 35th st., N.W., Washington, D.C.
- Wilbur, Lot,
Ave. C & 1st st., Snohomish, Wash.
- Wilcox, Levi, Ph.B.,
145 Woodlawn Ter., Waterbury, Conn.
- Wiles, Wood,
104 W. Walnut st., Bloomington, Ind.
- Wiley, Harvey W.,
Cosmos Club, Washington, D. C.
- Wilkerson, Jerome A.,
14th & Madison st., St. Louis, Mo.
- Willette, Sidney Burke,
3322 Bell ave., St. Louis, Mo.
- Williams, Arthur R.,
Sturgis, S. D.
- Williams, Edward,
4401 Harrison st., Chicago, Ill.
- Williams, Edward,
1 W. Main st., Madison, Wis.
- Williams, Geo. G.,
99 North st., Boston, Mass.
- Williams, John L., Doctor of Optics,
P.O.B.308, Three Rivers, Prov. Quebec.
- Williams, Lawrence S.,
St. Paul & 24th sts., Baltimore, Md.
- Williams, N. Emery, Ph.G.,
508 N. Grand ave., St. Louis, Mo.
- Williams, Sam. A.,
Elm st., Troy, Ala.
- WILLIAMS, SEWARD W., Ph.C., F.C.S.,
c. o. Bauer & Black, Chicago, Ill.
- Williams, Walter G.,
Charlotte C. H., Va.
- Willman, Wm. G.,
Adams st., Brownsville, Tex.
- Willson, Geo. A.,
106 Branch st., Lowell, Mass.
- WILSON, BENJ. O.,
19 Morse st., Newton, Mass.
- Wilson, Chas. F.,
355 East 30th st., Chicago, Ill.
- Wilson, Fred H.,
82 Main st., Brunswick, Me.
- Wilson, Geo. B.,
833 W. 6th st., Los Angeles, Cal.
- Wilson, Lincoln,
3973 Tennyson st., Denver, Colo.
- Wimmer, Curt Paul,
115 W. 68th st., New York, N. Y.
- Winberg, Washington W.,
5100 Lake ave., Chicago, Ill.
- Windolph, J. Fred.,
Hayes st., Norwich, N. Y.
- WINKELMANN, JOHN H.,
118 W. Lombard st., Baltimore, Md.
- Winkler, Hugo,
Sergt. 1st Cl., H. C., Post Hosp.,
Ft. Slocum, N. Y.
- Winslow, Edw. F.,
Bryn Mawr, Pa.
- Winter, Carl,
2812 E. 79th st., Cleveland, O.
- Winter, James H.,
1375 Valencia st., San Francisco, Cal.
- Wirth, Adam, Ph.M.,
5902 Hurst, cr. Elenore st., New Orleans
- Wirthman, John G.,
1335 Grand ave., Kansas City, Mo.
- Wirthmann, Joseph C.,
31st & Frost ave., Kansas City, Mo.
- Wisner, Ebert H.,
508 Washington st., N., Valparaiso, Ind.
- Witting, Fred. F., Ph.G.,
Longmont, Colo.
- Woehner, Fred. A.,
Drawer V, Great Falls, Mont.

- Wohlfarth, Walter F.,
 117 8th ave., Homestead, Pa.
 Wolf, Chas. A.,
 Broadway & Banks sts., Balto., Md.
 Wolf, James C.,
 Broadway & Banks sts., Balto., Md.
 Wolf, Michael F.,
 Eastern av. & Chester st., Balto., Md.
 Wolff, Daniel O.,
 5th & Washington sts., Hunting-
 don, Pa.
 Wolff, Edw. H.,
 522 Washington av., St. Louis, Mo.
 Wood, Horatio C., Jr., M.D.,
 434 S. 44th st., Philadelphia, Pa.
 Wood, James P.,
 2 Church st., New Haven, Conn.
 Wood, John Wm.,
 69 Shipwright st., Annapolis, Md.
 Wood, Wm. H.,
 Sanford, Me.
 Woodbury, Frank A.,
 No. 1 Lewis st., E. Boston, Mass.
 Woodhall, Fred.,
 30 Park Place, Rockville, Conn.
 Woodrow, James Arthur Stirling,
 317 Broadway, Cambridge, Mass.
 Woods, Samuel R.,
 110 S. Main st., Lamar, Colo.
 Woodworth, D. Olin,
 122 W. 1st st., Albany, Ore.
 Woolsey, Jesse F.,
 c.o. Strong Cobb & Co., Cleveland, O.
 Wooten, Thos. V., Ph.G.,
 43-93 Leon st., Boston, Mass.
 Wooten, Yandell Paul,
 Lebanon, Tenn.
 Wooyenaka, Keizo,
 564 W. 173d st., New York, N. Y.
 Worth, Thos. R.,
 Main st., Sebastopol, Cal.
 Worthington, John W. W.,
 State Hosp., Norristown, Pa.
 Wrench, Henry E., Jr., Ph.G.,
 610 Bloomfield ave., Montclair, N. J.
 Wright, James T.,
 22 Washington Sq., Newport, R. I.
 Wulling, Fred. J.,
 Minnesota Univ., Minneapolis, Minn.
 Wunderlich, Edw.,
 1532 Dryades st., New Orleans, La.
 Wunez, Jorye L.,
 Reina 115, Havana, Cuba.
 Wurdack, John H.,
 51 Grape st., Mt. Olive P. O., Pitts-
 burgh, Pa.
 Wyckoff, Elmer E.,
 246 E. 5th st., Brooklyn, N. Y.
 Yaffa, David Benjamin,
 191 Prospect Park, W., Brooklyn, N. Y.
 Yates, Edw. T.,
 809 South 16th st., Omaha, Neb.
 Yeomans, Sidney C., H. M. Sons of Rest,
 Signal Hill, Long Beach, Cal.
 YORSTON, MATTHEW M.,
 1063 Central ave., Cincinnati, O.
 Young, Chas. C.,
 C. S. O., Phil. Div., Manila, P. I.
 Young, Clarence C.,
 735 Church st., Nashville, Tenn.
 Young, Fred H.,
 1759 Ainslie st., Chicago, Ill.
 Young, Geo. C.,
 Post Hosp., Jefferson Barracks, Mo.
 Young, Geo. O.,
 Buckhannon, W. Va.
 Young, Harry G.,
 Forest & Birmingham aves., Ava-
 lon, Pa.
 Youngken, Heber W., Ph.G., A.B., A.M.,
 5729 Springfield av., Philadelphia, Pa.
 Zamora, Manuel,
 917 Sebastian st., Manila, P. I.
 Zeamer, Harry W.,
 240 Locust st., Columbia, Pa.
 Zeman, Otto,
 3909 W. 26th st., Chicago, Ill.
 Zerbin, August,
 21 M st., N. E., Washington, D. C.
 Ziefle, Adolph,
 1132 College st., Fargo, N. D.
 Zieg, John,
 35 2d st., San Francisco, Cal.
 Ziegler, Howard P.,
 201 Windsor st., Reading, Pa.
 ZIEGLER, PHILIP M.,
 526 Penn st., Reading, Pa.

Zieske, Arthur, Ph.G.,
214 1st ave., S. W., Watertown, S. D.
Zimmer, Wm. A.,
119 Main st., Lamar, Colo.
Zimmerman, Theophilus,
Rose Free Dispensary, 7th & Cherry
sts., Terre Haute, Ind.
Zinn, Chas. E.,
300 W. 9th st., Kansas City, Mo.
ZOELLER, EDW. V.,
Main st., Tarboro, N. C.

Zoller, Glenn M.,
Thousand Island Pharmacy, Alex-
andria Bay, N. Y.
Zottman, Wm. H.,
1 Church st., Burlington, Vt.
Zuenkeler, John F., Ph.G.,
1902 Vine st., Cincinnati, O.
Zwick, Albert O.,
1104 E. MacMillan st., Cincinnati, O.
Zwick, Mary Hall (Mrs.),
511 S. Humphrey av., Oak Park, Ill.

GEOGRAPHICAL ROLL OF MEMBERS

HONORARY MEMBERS

FOREIGN COUNTRIES.

ENGLAND.

E. M. Holmes, F.L.S., *London*, 1899.
Henry George Greenish, *London*, 1913.
David Hooper, F.I.C., F.C.S., *Weston*, 1899.

GERMANY.

Dr. Arthur Meyer, *Marburg*, 1910. Dr. Ernst Schmidt, Geh. Regierungsrath,
Dr. Herman Schelenz, *Cassel*, 1912. *Marburg*, 1899.

SWITZERLAND.

Dr. Alexander Tschirch, *Bern*, 1910.

ACTIVE MEMBERS

(List corrected to March 25, 1914.)

Members are requested to report any inaccuracies in these lists, and to notify the General Secretary and Treasurer of all changes of address.
(The names of Life Members in Capitals. Names of Life Members under the old Constitution in *italics*.)

UNITED STATES OF AMERICA.

ALABAMA—ALASKA—ARKANSAS.

ALABAMA.

Athens.

Morris, Elisha Greene, Jr..... 1914

Auburn.

Blake, Lynn Stanford..... 1914

Dothan.

Harrison, Marvey..... 1913

Gadsden.

Vance, Winfield Scott..... 1909

Whorton, Carl..... 1908

Guntersville.

Thomason, William Pearce..... 1910

Mobile.

Eichold, Bernard Herbert..... 1905

Van Aller, Thomas S..... 1907

Van Antwerp, James Callanan.. 1905

Montgomery.

KNABE, GUSTAVUS ALEXANDER.. 1876

Prattville.

Scott, Clarence Alexander..... 1905

Talladega.

McDiarmid, Daniel Palmer..... 1909

Troy.

Williams, Sam. A..... 1914

Tuscaloosa.

Bingham, William Ellison, A.B.,
Univ. of Miss..... 1909

Tuskegee.

Lewis, Lawrence Campbell..... 1910

ALASKA.

Douglas.

Smith, Guy Livingstone..... 1909

Ketchikan.

Ryus, Floyd Eugene..... 1909

ARIZONA.

ARKANSAS.

Batesville.

McMahon, Stonewall Jackson.. 1914

Camden.

MORGAN, AYLMEER LEE..... 1890

Clarksville.

Warren, Robert Arthur..... 1914

Fort Smith.

Sparks, James Mitchell..... 1894

Hope.

Gibson, John Sceva..... 1908

Hot Springs.

Beasley, Robert Sidney..... 1906

Eisele, Martin Augustine..... 1907

Jennings, Algernon Coleman... 1907

Klein, Ernest Frederick..... 1894

Lehman, Charles Walter, A.B.. 1907

Schachleiter, Francis George... 1906

ARKANSAS—CALIFORNIA.

Jasper.

Arbaugh, Rufus C., Ph.G..... 1912

Little Rock.

Bond, John Barnitz, M.D., Surgeon C. S. A..... 1883

Fein, Mary A. (Miss),..... 1907

Snodgrass Latta Kavanaugh.... 1901

Paragould.

Paris, James Ernest..... 1908

Piggott.

Potter, Maynard H., Ph.G., Ph.C. 1906

Pine Bluff.

DEWOODY, WILLIAM LAWRENCE.. 1887

Spadra.

Stewart, John William, Ph.G., Ph.M. 1908

Stuttgart.

Webb, John W..... 1913

Warren.

Appleton, William Riley..... 1901

CALIFORNIA.

Alameda.

Sutherland, George McKenzie.. 1909

Arcata, Humboldt Co.

Keller, William Otto Emanuel.. 1908

Auburn.

Stevens, Frederick Solon..... 1903

Bakersfield.

Hughes, James A..... 1909

Berkeley.

Jaffa, M. E..... 1913

Luck, Julius Alex. W..... 1910

Neil, Matthew, Sergt. 1st Cl., H. C., U. S. A..... 1911

Warner, William James..... 1913

Corning.

Dawson, Byron F..... 1909

Eureka.

Bohmansson, Robert Hugo..... 1901

Correll, Eugene Philip..... 1909

Fort McDowell.

Hamner, James Ferris..... 1906

Fortuna.

Bowman, Reginald Hamilton... 1909

Fresno.

Smith, Geo. Henry..... 1909

Fruitvale.

Philip Waldemar Bruce, Ph.G., Phar.D. 1907

Gilroy.

Johnson, Edward Franklin..... 1909

Haywards.

Sporndli, Ernest..... 1906

Long Beach.

Smith, Lauriston Stephen..... 1892

Yeomans, Sidney Clarence..... 1906

Los Angeles.

Binz, Edward Gabriel..... 1909

Dickinson, William Richard.... 1909

Freeman, James Joseph..... 1909

Guest, Wilbert Hillman..... 1909

Howard, Mrs. Fletcher..... 1905

Kirkland, Derwentwater..... 1889

Ramage, Robert Courtland..... 1909

Reilly, Robert C..... 1901

Sauvinet, Charles D..... 1902

Schiff, Ludwig..... 1912

Voeckell, Henry G..... 1909

Watters, Alexander John..... 1909

Wilson, George Baright..... 1907

Menlo Park.

Selzer, Mary E..... 1914

Monterey.

La Grindeur, Romanus A., Sergt. 1st Cl., H. C., U. S. A..... 1912

Mountain View.

Wagner, Louis..... 1908

Oakland.

Leet, Robert Andrew..... 1907

Varney, Edward Francis..... 1892

Ontario.

Jesson, Jacob..... 1872

CALIFORNIA—COLORADO.

Orland, Glenn Co.

Birch, May Cushman..... 1909

Pasadena.

Leavitt, Adoniram Judson..... 1905

*Patton.*Dyna, Carl Frederick Julius,
Ph.G. 1909*Redwood City.*

Genochio, Edward Peter..... 1914

Riverside.

Porter, G. Ellis, A.B..... 1909

Sacramento.

Kirk, H. S..... 1913

Lichthardt, George Henry Philip,
Ph.G. 1902*San Anselmo.*

Hund, George Bernard..... 1910

San Diego.

Rosseau, Joe C..... 1914

Strahlmann, Edward..... 1909

San Francisco.

Baer, Edward Arthur..... 1907

Berkowitz, Alexander, Sergt. 1st
Cl. H. C., U. S. A..... 1911

Bowerman, Kenneth Burton.... 1909

Boyken, John William..... 1902

Boyson, John Henry..... 1905

Briggs, Armand Eugene..... 1907

Brown, Clark L., Sgt. 1 Cl. H. C.

U. S. A..... 1911

Carey, Henry Benjamin..... 1909

Crawford, Albert C..... 1912

Dawson, John Henry, Ph.G.... 1882

Esterly, Milton Theis, Sgt. 1 Cl.

H. C. U. S. A..... 1912

Fletcher, David M..... 1904

Flint, John Henry..... 1909

Green, Franklin Theodore..... 1908

Harris, Samuel J., Sgt. H. C.,

U. S. A..... 1912

Headen, Claude Thomas, Ph.C. 1909

Jorgenson, Edward B..... 1902

Lackenbach, Fred Isadore, Ph.C. 1907

Lengfeld, Joseph Louis..... 1909

McDonnell, Herbert Leslie, Ph.G. 1908

Mehrtens, John Kernikamp..... 1913

O'Gorman, Theophilus Vincent. 1897

Poehner, Adolf Adam, Ph.G.,
M.D. 1907

Prior, Toney..... 1905

Reum, Arthur William..... 1910

Reynolds, George, Sgt. 1st Cl.,
H. C., U. S. A..... 1912

Roehr, Clarissa May..... 1908

Rogers, Edward..... 1902

Schmidt, Valentine, B.S., M.S.,
M.D., Ph.D..... 1887Schneider, Albert, B.S., M.S.,
M.D., Ph.D..... 1899

Sharp, Solomon Albert..... 1902

Smith, Carl Edward..... 1911

Stange, Carl Frederick, Ph.G... 1897

White, Jennie M..... 1914

Winter, James Henry..... 1904

Zieg, John..... 1913

Sanger.

Brehler, Oscar August..... 1909

San Jose.

Munson, James Grant..... 1908

Pellerano, Nicholas Andrew.... 1909

Sebastopol.

Worth, Thomas Renfro..... 1909

South Berkeley.

McGee, Stewart Thomas..... 1912

Turlock.

Hudiberg, Alfred, Ph.C..... 1912

Vacaville.

Farrell, Anna Marie (Miss).... 1914

*Vallejo.*Hammar, Alrick, Chief Pharma-
cist U. S. Navy..... 1897

COLORADO.

Akron.

Van Liew, William Kirk..... 1913

Aspen.

Killey, Robert Smith, Ph.G.... 1913

COLORADO.

<i>Boulder.</i>			
Fine, Eben Givens.....	1913	Seymour, James.....	1903
Washburn, Homer Charles.....	1905	Skinner, Charles H.....	1909
<i>Canon City.</i>		Snider, Herbert M.....	1913
Egbers, Lloyd.....	1913	Strickland, Bert W.....	1913
<i>Central City.</i>		Swoboda, Adolph.....	1909
Best, John.....	1886	WALLBRACH, ARTHUR.....	1881
Davies, Llewellyn Powell.....	1891	Weimer, Carl G.....	1913
<i>Colorado City.</i>		Wilson, Lincoln.....	1910
Meyer, Walter Ferdinand.....	1913	<i>Fort Collins.</i>	
<i>Colorado Springs.</i>		Scott, Alexander Weir.....	1906
Butcher, David Yerbey.....	1910	<i>Fort Logan.</i>	
<i>Cripple Creek.</i>		Fonteyne, Gustave J.....	1912
Lewis, Griffith R.....	1909	<i>Fowler.</i>	
<i>Deer Trail.</i>		Palmer, William Gordon.....	1909
Schenck, Fannie K. (Mrs.).....	1906	<i>Glenwood Springs.</i>	
<i>Delta.</i>		Barnes, Charles Dean.....	1908
Harding, Chester Ernest, Ph.G.	1911	<i>Grand Junction.</i>	
<i>Denver.</i>		Emerson, Irving Lewis.....	1913
Alkire, Lewis L.....	1908	<i>Hayden.</i>	
Austin, Frank A.....	1910	Downs, Fred Clayton.....	1913
Beukma, William.....	1913	<i>Lafayette.</i>	
Bresler, Simon L.....	1908	Dow, John Peter.....	1904
Campbell, William Boyd.....	1913	<i>Lamar.</i>	
Charles, Corlis Duffy.....	1913	Woods, Samuel Ross, Ph.G.....	1913
Clark, Alfred William.....	1908	Zimmer, William A.....	1913
Clayton, Charles J.....	1905	<i>Las Animas.</i>	
Cole, Adelbert C.....	1913	Cooke, Maynard Ellsworth.....	1913
Cordes, Henry.....	1913	Cunning, George Albert.....	1913
Eberhardt, Edward.....	1912	Rupert, J. F.....	1913
Hensel, Samuel Theodore, Ph.G.	1913	<i>Leadville.</i>	
Hover, William Adgate.....	1895	Kolsch, Julius.....	1902
Hover, William Tracy.....	1913	Whitmore, George Comings.....	1912
Jeancon, Louis Augustus.....	1912	<i>Longmont.</i>	
Lagasse, Victor Scott.....	1912	Witting, Frederick Frank, Ph.G.	1902
Lord, Frank Jotham.....	1912	<i>Pueblo.</i>	
Martin, John Albert.....	1909	Mortenson, Frank Emil, Ph.G..	1910
McKenzie, Robert Henry, Ph.G.	1908	<i>Rollinsville.</i>	
Nitardy, Ferdinand Wilhelm...	1905	Longnecker, Holton, Ph.G.....	1913
Payne, Winfield Scott, B.A.....	1913	<i>Salida.</i>	
Powers, Emmett.....	1912	Bode, Theodore Christian.....	1912
Ryan, Alonzo S.....	1913		
Scholtz, Edmund L.....	1913		
Scholtz, William O.....	1913		
Secheverell, Hugh Bennett.....	1913		

COLORADO—COLUMBIA, DISTRICT OF—CONNECTICUT.

Steamboat Springs.

Green, William W..... 1913

Sterling.

Bauman, Charles R..... 1913

Sugar City.

Hamilton, Robert Allen..... 1913

Yuma.

Dakan, Eugene S..... 1910

COLUMBIA, DISTRICT OF

Anacostia.

Weiss, Conrad Henry..... 1900

Washington.

Alsberg, C. L., A.B., A.M., M.D. 1912

BOYD, GEORGE WASHINGTON..... 1883

Boyd, Geo. Washington Francis 1912

Bradbury, Wymond Henry,

Phar.D. 1895

Davis, Harry Alexander..... 1911

Flemer, Louis..... 1895

Floyd, Henry Bussey..... 1908

Franzoni, Joseph Dunbar..... 1900

Gahn, Henry..... 1902

Hale, William Worth..... 1910

Henkel, Miss Alice..... 1902

Henry, Frank Clinton..... 1894

HILTON, SAMUEL LEWIS, PHAR.D 1890

Kalusowski, Henry E..... 1904

Kebler, Lyman Frederic..... 1894

La Grange, John V., A.M., Ph.G. 1905

Oehsen, Herman von..... 1911

Quigley, Richard Lucien..... 1902

Rabak, Frank..... 1905

Richardson, Willard Stowell... 1900

Riley, John Thomas, Sgt. 1Cl.

H. C. U. S. A..... 1912

Scott, Edgar Burroughs..... 1905

Sievers, Arthur..... 1906

Spire, William Barton, Phar.D. 1908

Stockberger, Dr. Warner W... 1914

Taylor, Augustus Carrier..... 1900

True, Rodney Howard, B.S., M.S.,

Ph. D. 1904

Vane, Patrick P..... 1911

Weller, Franklin Pierce..... 1900

White, Joseph Leyden..... 1909

WILBERT, MARTIN INVENTIUS.... 1902

Wiley, Harvey Washington..... 1902

Zerbin, August..... 1912

Tacoma Park.

Baker, Quentin Johnston, Sgt.

1Cl. H. C. U. S. A..... 1912

Thuney, Francis Edward..... 1911

CONNECTICUT.

Bridgeport.

Jamieson, George Alexander.... 1903

Leverty, John Augustine..... 1900

Ostrofsky, Frank Joseph..... 1910

Danielson.

Morin, Ludger Joseph..... 1905

Hartford.

Gladding, Curtis Parsons..... 1912

Seinsoth, John Jacob..... 1900

Stoughton, Mary A. (Mrs.).... 1913

Middletown.

PITT, JOHN RICHARD,..... 1872

New Haven.

Gessner, Emil Adolph..... 1878

Jenkins, Edward H..... 1913

Spalding, Clarence Gilman..... 1910

Wood, James Prior..... 1890

Rockville.

Woodhall, Frederick..... 1908

Simsbury.

Lathrop, Arthur E..... 1910

Stamford.

Weicker, Theodore..... 1905

Waterbury.

Wilcox, Levi, Ph.B..... 1903

West Haven.

Andrews, William Augustus

Peck 1908

Willimantic.

Cartier, Gustave O..... 1913

Winsted.

Judson, Arthur F..... 1907

DELAWARE—FLORIDA—GEORGIA—HAWAIIAN ISLANDS—IDAHO.

DELAWARE.

Fort Dupont.

Knapp, Gustav..... 1912

Seaford.

Kaufman, Reuben M., Ph.G.... 1909

Wilmington.

WATSON, HERBERT KENNEDY.... 1888

FLORIDA.

Bradentown.

Seyfert, Paul..... 1909

Bartow.

Oglesby, Robert McGrady..... 1914

Brooksville.

Lemasters, William Otterbein.. 1905

Daytona.

Clark (Mrs.), Aaron P..... 1914

De Land.

Fisher, George Washington.... 1893

Gainesville.

Johnson, Washington M..... 1910

Jacksonville.

Bettes, Charles C..... 1909

Jones, William D..... 1913

Norton, Edwin Massa..... 1913

Stewart, Harry E..... 1913

Key West.

Miller, Charles..... 1897

Ocala.

Groves, Henry Conrad..... 1903

Ormond.

Thornton, Macon..... 1913

Palatka.

Ramsaur, David Wilfong..... 1902

Pensacola.

Pettersen, Ernest Wilhelm..... 1905

Satsuma Heights.

Richtmann, William Oscar, Ph.

G., B.S..... 1904

St. Augustine.

Speer, Charles Claude..... 1902

Tallahassee.

Henry, Arthur Malcolm, B.S... 1913

Tampa.

Berger, Ernest..... 1902

GEORGIA.

Atlanta.

Elkin, William Simpson..... 1905

Payne, Dr. George Frederick... 1893

Stallings, Robert Emmett..... 1914

Augusta.

LAND, ROBERT HENRY..... 1859

Land, Robert Henry, Jr..... 1902

Timbrook, D. E..... 1912

Macon.

Morris, Max, Ph.G..... 1898

Ocilla.

Smith, Isaac Clifton..... 1913

Savannah.

Brigham, Lawrence Stanton.... 1914

Rowlinski, Robert Antone..... 1892

Solomons, Isaiah Abraham..... 1894

Solomons, Isaiah, Jr..... 1913

Thomasville.

Thomas, Robert, Jr..... 1888

HAWAIIAN ISLANDS.

Kalawao Molokai.

Gibson, Frank Leighton..... 1904

Honolulu.

Hermann, Christopher..... 1913

IDAHO.

Boise.

Ballou, Clarence Orlando..... 1909

Burley.

Sprague, Adelbert N..... 1910

Eagle Rock.

Hughes, John Richard..... 1910

IDAHO—ILLINOIS.

Grangeville.

Pulse, John J..... 1908

Pocatello.

Buehler, John J..... 1913

Whittlesey, Henry Hawley.... 1910

Twin Falls.

Skeels, Howard Morton, Ph.C. 1907

Spargur, Ray Miles..... 1910

ILLINOIS.

Arrowsmith.

Lester, George Friend..... 1910

*Aurora.*Frauenhoff, Frederick Louis,
Ph.G. 1909

Staudt, Louis Carl, Ph.G..... 1890

Belleville.

Wasem, John..... 1911

Blue Island.

Dorjahn, John A..... 1914

Cairo.

Berkowitz, Morris Emanuel.... 1910

Schuh, Paul Gustav..... 1894

Camp Point.

Bartells, George C..... 1881

Canton.

Webster, Richard C..... 1914

Chicago.

Ackermann, Albert George, Ph.G. 1909

Adamick, Gustave Hattenhauer. 1891

Anderson, Carl Godfrey..... 1907

Avery, Charles Hamilton..... 1905

Backus, Edwin John..... 1913

Barrett, Marcus..... 1912

Bartlett, James E..... 1906

Bartlett, Nicholas Gray 1861

Bate, Henry John..... 1906

Becker, Irwin Atwood, B.S.,

Ph.G. 1905

Behrens, Emil Christian Lewis. 1893

Biermann, William Henry..... 1908

Blahnik, Marie (Mrs.)..... 1905

Blocki, John..... 1909

Bodemann, Wilhelm..... 1906

Boehm, John J..... 1905

Bruder, Otto Emil, Ph.G..... 1905

Brunn, Harold Nicholai..... 1905

Burdick, Alfred S., M.D..... 1913

Burdick, Merle M..... 1913

Cannon, T. F..... 1913

Christensen, Henry C..... 1906

Clark, Albert Henry, Ph.G..... 1905

Colson, Henry W..... 1913

Combs, Delta E..... 1911

Cooban, Benjamin Slater..... 1902

Craig, Hugh..... 1907

Crowley, James Patrick..... 1908

Day, William Baker, Ph.G..... 1895

Dreyfus, Henry W..... 1914

Druehl, Amanda Stahl (Mrs.) 1903

Druehl, Louis A..... 1908

Elisburg, Louis A..... 1913

Engelhard, George Pierre..... 1903

Fantus, Bernard, M.D..... 1908

Fenger, Frederic..... 1910

Fischnar, John Ferdinand..... 1905

Forbrich, Charles Anthony.... 1913

Forster, Isadore A..... 1912

Fry, Herman..... 1902

Fry, Narcys George..... 1906

FULLER, OLIVER FRANKLIN..... 1869

Gathercoal, Edmund Norris,

Ph.G. 1905

Gordin, Henry Mann, Ph.D... 1899

Grassly, Charles William..... 1884

Gray, Margaret McClintock

(Mrs.) 1901

GRAY WILLIAM..... 1892

Haeseler, Loren Milton..... 1906

Hartwig, Otto Julius..... 1892

Hellmuth, Joseph Anthony.... 1905

Hermanek, Joseph Charles.... 1904

Hilpert, Willis Stose..... 1908

Hoelzer, Bruno A. C..... 1913

Holthoefer, Herman John..... 1912

Hood, Harry Alling..... 1910

Hottinger, Otto George..... 1910

Hoover, George William..... 1905

JAMIESON, THOMAS NEVIN.... 1903

Jehlik, Anton Josef..... 1906

Jensen, Gerhard H..... 1906

Josenhans, Reinhardt C.J., Ph.C. 1907

ILLINOIS.

Kraemer, George Charles.....	1913	Stuchlik, John.....	1913
Kramer, Wilhelm.....	1908	Summers, Franklin Peale.....	1913
Ladish, Erich Herman.....	1905	Umenhofer, Adolph.....	1908
Lamont, William Hamilton....	1912	Van Schaack, Cornelius Peter..	1905
Larsen, L. P., Ph.G.....	1908	VOISS, ARCADIUS.....	1901
Loesch, William.....	1912	Warren, Louis Eugene.....	1909
Lueder, John T.....	1909	Wells, James Herbert, Ph.G., LL.B.	1908
Mahaffy, John A.....	1913	Williams, Edward.....	1913
Mares, Frank Martin, Ph.G...	1902	WILLIAMS, SEWARD WHITING...	1887
Matthews, Charles Edwards...	1893	Wilson, Charles Frazee.....	1906
McClugage, John Jordan, Ph.G.	1905	Winberg, Washington William.	1906
McConnell, Charles Henry.....	1899	Young, Fred H.....	1913
McCausland, Harloven H.....	1913	Zeman, Otto.....	1911
Meyer, Frederick Hugo.....	1907		
Miller, Albert, Ph.G.....	1907	<i>Cicero.</i>	
Miner, Maurice Ashbel, Ph.C., Phar.D.	1880	Wicarius, Max John.....	1908
Morrisson, James William.....	1912		
Mrazek, Lea Ludwig.....	1914	<i>East St. Louis.</i>	
Myers, Charles Joseph.....	1905	Burnette, Aaron Gard.....	1912
Oglesby, George Daniel.....	1905	Knoebel, Percy Thomas.....	1907
Patterson, Charles Waggener...	1905	Knoebel, Thomas.....	1892
<i>Patterson, Theodore Henry</i>	1869		
Potts, Thomas Humphreys....	1906	<i>Elgin.</i>	
Puckner, William August, Ph.G., Phar.D.	1888	Schultz, Charles Frederick Wm.	1911
Rhode, Rudolph Ernst.....	1887		
Sandkoetter, Henry P.....	1912	<i>El Paso.</i>	
Sass, Stephen Konrad.....	1905	Michels, John B.....	1913
Schapper, Ferdinand C.....	1913		
Scheips, Theodore I.....	1905	<i>Evanston.</i>	
Scherer, Andrew, Ph.G.....	1884	Lee, John Victor.....	1910
Schimelfenig, Charles Howard.	1908	Mills, George P.....	1907
Schmid, Louis A.....	1911		
Schmid, Rose Phillipus.....	1911	<i>Fairmount.</i>	
Schmidt, Frederick Michael, Ph.G.	1887	Tilton, Claude Enoch.....	1905
Schulz, Henry Lewis.....	1905		
Secord, George Louis, M.S., Phar.D.	1910	<i>Forest Park.</i>	
Sethness, C. Henry.....	1914	Jacob, Charles William.....	1914
Sheblessy, Michael Albert.....	1909		
Snow, Clyde Mason, Ph.G., M.A.	1903	<i>Freeport.</i>	
Snow, Herbert Waldemar, Ph.C.	1912	McNess, Frederick Wm., P.D..	1906
Snyder, Cloyde W.....	1913		
Snyder, William Edward, Ph.G.	1909	<i>Geneseo.</i>	
Stadelmann, Harry Edgar.....	1909	Stamm, Dante Milton.....	1896
Stephan, Otto Paul, Ph.G.....	1909		
Storer, Charles Adelbert.....	1906	<i>Girard, Macoupin Co.</i>	
		Deck, Lewis Cass.....	1901
		<i>Grayville.</i>	
		Wheatcroft, John Christopher..	1912
		<i>Greenup.</i>	
		Conzet, Rufus Warren.....	1904

ILLINOIS—INDIANA.

Jacksonville.

Shreve, Joseph F..... 1912

Lockport.

Mackenhimer, Don G., Ph.G... 1906

Mascoutah.

Dauber, Curt Louis..... 1913

Maywood.

Whipple, Mathew K..... 1913

Moline.

Anderson, Adolph Emil..... 1913

Brunstrom, Charles, Ph.G..... 1912

Lindvall, Charles Gustaf..... 1897

Sohrbeck, George Henry..... 1888

Sohrbeck, George Wm., Ph.G.. 1897

Mt. Vernon.

Morse, Edward Worth..... 1896

Oak Park.

McCauley, Charles Edward..... 1903

Zwick (Mrs.) May Hall..... 1914

Pekin.

Ehrlicher, Henry Michael..... 1892

Peoria.

Benton, Wilbur Merritt..... 1888

Fieselmann, Sidney Frederick.. 1914

Lueder, Fritz..... 1894

Weinkauff, Jacob..... 1914

Wells, Francis Ellsworth..... 1913

Pesotum.

Hoffmann, Geo. Frederick, Ph.G. 1902

Pontiac.

Butler, Frank J..... 1914

Quincy.

Achelpohl, Charles H..... 1913

Dickhut, Lawrence August, Ph.G. 1910

Hagemann, Wm. Herman, Ph.G. 1910

Heidbreder, Albert Henry..... 1905

Heidbreder, Edgar Philip..... 1913

Roanoke.

Knapp, William Michael..... 1913

Rock Island.

Hartz, William Theodore..... 1909

Walker, Frederick Douglas Gar-
nett, Ph.G., Opt.D..... 1912*Rockford.*

Freburg, Amel E..... 1910

Rosiclare.

Paris, William John James.... 1913

Salem.

Sweeney, A. J..... 1911

Springfield.

Dodds, Frederick Clinton, Sec'y

Ill. State Board Pharm..... 1913

Dodds, Richard Newton..... 1902

Stronghurst, Henderson Co.

Harter, Isaac Foster, M.D..... 1893

Tuscola.

Stacy, Marion Franklin..... 1903

Urbana.

Beal, George Denton..... 1907

West Salem.

Grace, Paul..... 1913

INDIANA.

Albion.

Miller, Charles Elliott..... 1899

Angola.

Sherrard, Charles Cornell..... 1893

Bloomington.

Wiles, Wood..... 1914

Bluffton.

Stout, Marion Alphon, Ph.G... 1906

Columbus.

Otto, Theodore Gotthelf Edward 1900

Stahlhuth, Ernst Heinrich Wil-
helm, Ph.G. (Cincinnati)..... 1887*Converse.*

Gift, Wendell J..... 1913

Elkhart.

Beardsley, Andrew H..... 1913

INDIANA.

Evansville.

Bohn, George W.....	1907
Brown, George Wilton.....	1914
Hardigg, William L.....	1913

Farmersburg.

Barbre, John Vandever, Jr.....	1910
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Ft. Wayne.

Mertz, Edward Leander.....	1904
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Indianapolis.

Bartholomew, William C.....	1913
Bibbins, Francis Eugene, Ph.G.	1909
Blodau, Robert P.....	1908
Carter, Frank Henry.....	1891
Carter, Harlen Wilson Searight	1913
Eberhardt, Ernest Godlove, Ph.G.	1906
Eckler, Charles Ralph.....	1903
Eldred, Frank Randall.....	1905
Hall, A. B.....	1914
Huder, Henry J.....	1894
Hurty, John Newell, M.D., Phar.D.	1882
Kassulke, August.....	1905
Keene, Jerome J.....	1910
Lilly, Eli.....	1906
Lilly, Josiah Kirby.....	1890
Lynn, Charles Jackson.....	1906
Miller, Fred Anderson.....	1913
Miller, Joy Lowell.....	1912
Mueller, J. George.....	1906
Niles, Edward Hulbert.....	1914
Pfafflin, Henry Adolph.....	1892
Pruyn, Murry K.....	1912
Schwartz, Maurice Paul.....	1906
Showalter, Ralph W.....	1913
Stucky, Edward W., Ph.B., A.M.,	1908
Thorburn, Albert David.....	1902
Watkins, Charles William.....	1907
Werner, William F.....	1908

Kouts.

Benkie, John Gottlieb.....	1910
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Lafayette.

Best, Frank Merrell.....	1914
Dewey, Albert Haskin, Ph.G., B.S., M.S.....	1909
Gidley, William Francis, Ph.C., B.S.	1910

Jordon, Charles B., Ph.C., B.S.,

M.S. 1909

Schultz, John Jacob..... 1904

La Porte.

Meissner, Frederick William, Jr.,

Ph.G. 1890

Logansport.

Hoffman, George William..... 1904

Mt. Vernon.

Fogas, William Henry, Ph.G... 1907

New Albany.

Knoefel, Bruno..... 1896

New Carlisle.

Warner, Francis Delop..... 1904

Notre Dame.

Green, Robert Lee..... 1906

Rockport.

Basye, Taylor Colman..... 1909

Salem.

Rudder, William Hiram, Ph.G. 1907

Seymour.

Loertz, Carl Edward..... 1907

South Bend.

Bastian, Otto Carl..... 1903

Kuss, Ralph Henry..... 1911

Reyer, Emil, Ph.G..... 1907

Terre Haute.

Cook, Albert..... 1913

Zimmerman, Theophilus..... 1914

Troy.

Gaesser, Theobald Theodore,

Ph.G. 1901

Valparaiso.

Heineman, Albert F..... 1905

Perkins, Robert Loyal..... 1914

Roe, Joseph Newton..... 1902

Timmons, George Demming,

Ph.G., B.S., Ph.C..... 1905

Wisner, Ebert H..... 1914

Warren.

Hickerson, William Henry..... 1894

INDIANA—IOWA.

West Terre Haute.

Cassady, Burton..... 1909

Winchester.

Sala, Albert Franklin..... 1905

IOWA.

Adel.

Ward, Augustus J..... 1893

Amana.

Koch, August Frank, Ph.G..... 1903

Schadt, Conrad, R.P..... 1903

Ames.

LLLL

Gaessler, William George..... 1912

Judisch, George..... 1913

Boone.

Ridgway, Lemuel Augustus..... 1882

Cedar Rapids.

Boyson, George H..... 1908

Clear Lake.

Etzel, John Leonhardt..... 1897

Clinton.

John, Milo Jesse..... 1910

Council Bluffs.

Fricke, Charles B..... 1909

Davenport.

BALHARD, JOHN WINTHROP,
PH.G. 1871

Burnside, Carl Bishop..... 1913

Osborn, Frank D..... 1913

Denison.

Schlumberger, Anna Babette.... 1913

Schlumberger, Philip August... 1913

Des Moines.

Berner, Carl Albert..... 1903

Kagg, Elbert O., Ph.G., Ph.C... 1913

Mall, F. A..... 1913

Parker, Robert Lemuel..... 1912

Dow City.

Anderson, Ingewald A., Ph.G.. 1913

Ft. Dodge.

OLESON, OLAF MARTIN..... 1877

Ft. Madison.

SCHAFER, GEORGE HENRY..... 1871

Homestead.

Miller, Frederick William..... 1902

Hull.

Coad, William A..... 1911

Iowa City.

BOERNER, EMIL LOUIS..... 1877

Cooper, Zada Mary, Ph.G..... 1909

Kuever, R. R., Ph.G., Ph.C.... 1912

Kullman, Karl William..... 1914

Teeters, Wilber John..... 1902

Utterback, Earl..... 1913

Keokuk.

Kiedaisch, George Arthur..... 1904

Parsons, George L., Ph.G..... 1912

Lauder.

Jurgensen, Peter H..... 1911

Maquoketa.

Luckiesh, Edward..... 1913

Nitzsche, John Charles..... 1909

Marshalltown.

Mayer, Peter..... 1906

Muscatine.

Halstead, Alice Louisa (Mrs.). 1892

Springer, Harry Hoopes..... 1911

Packwood.

Thomas, Glenn D..... 1912

Plover.

Larson, Martin..... 1906

Salem.

Pierce, Ira Hotchkiss..... 1913

Sioux City.

SCHERLUNG, GUSTAV, Ph.G..... 1884

Soper, George M..... 1909

Thelander, Creston Carlos.... 1902

Thompson, Edwin Thomas.... 1913

Winfield.

Lindly, John Milton, Phar.D... 1901

KANSAS—KENTUCKY.

KANSAS.

Atchison.

Noll, Mathias, Ph.C..... 1901

Beloit.

Bunch, J. George..... 1913

Denton.

Stewart, Allen Thomas..... 1913

Ellsworth.

Sherriff, William Ebenezer..... 1904

Gypsum City, Saline Co.

Schmitter, Jonathan..... 1892

Havana.

Lindley, Patrick H..... 1913

Humboldt.

Hess, W. I..... 1913

Lawrence.

Dick, William D..... 1913

Havenhill, L. D..... 1900

LEIS, GEORGE..... 1869

Moore, John Thomas..... 1888

Sayre, Lucius Elmer..... 1883

Sterling, Charles Morgan, A.B. 1911

Stevenson, Arthur Earl..... 1912

Varnum, Walter Howard..... 1912

Watson, George Nathaniel..... 1910

Marysville.

Riesen, David V..... 1909

Ottawa.

Becker, Charles Lewis, Ph.C... 1892

Overbrook.

Topping, Arthur Ellsworth, Ph.G. 1904

Scandia.

Nywall, David Alfred, B.S., Ph.G. 1910

Troy.

Sinclair, Edward Albert, Ph.C.. 1913

Wichita.

Chism, John Samuel, Ph.G..... 1909

Frazier, William John..... 1909

Winfield.

Bird, Richard B..... 1910

Friedenburg, Maximilian Wilmer 1904

KENTUCKY.

Augusta.

Bertrams, Henry..... 1914

Columbus.

Summers, R. C..... 1914

Covington.

Eichler, Henry..... 1913

Pieck, Edward Ludwig..... 1887

Fort Thomas.

Shull, George J..... 1913

Frankfort.

Gayle, John William..... 1891

Hawesville.

Patterson, George Orville..... 1907

Henderson.

Elam, John Thomas..... 1907

*Lexington.*Brown, Linwood Arnold, Ph.C.,
Pharm.D. 1909

Cassell, Robert Lee..... 1910

Cooper, James Evans..... 1907

Harting, Rudolph R..... 1902

Porter, Chilton Scott..... 1914

Louisville.

Buschemeyer, Henry, Jr..... 1909

DIEHL, CONRAD LEWIS, Ph.M.. 1863

Dilly, Oscar Charles..... 1888

Dimmitt, Addison..... 1895

Eisele, George..... 1908

Gould, George H..... 1914

Hurley, Horace Oliver..... 1907

JONES, SIMON NEWTON..... 1870

Krul, John George, Ph.G..... 1907

Mueller, Otto Edward..... 1907

NEWMAN, GEORGE ABNER..... 1866

Overton, Burr Martin..... 1903

Schlosser, Peter..... 1902

Votteler, William..... 1895

Weiss, William J..... 1910

Newport.

Bange, Otto Franz..... 1904

Greule, Albert Martin..... 1903

KENTUCKY—LOUISIANA—MAINE.

Owenboro.

Danhauer, William Edward.... 1914

Paducah.

Welsh, Joseph Bruner..... 1910

Paris.

Clarke, Charles Jordan..... 1904

Winchester.

Martin, James Henderson, Ph.G. 1908

LOUISIANA.

Kentwood.

Carruth, Luther E..... 1914

Natchitoches.

McClung, E. L..... 1910

New Orleans.

Asher, Philip..... 1905

Capdau, Pierre August..... 1902

Di Trapani, Anthony..... 1909

Earhart, Frederick A..... 1904

Feldner, George D..... 1913

Godbold, Fabius Chapman..... 1887

Grace, Robert F..... 1914

Grasser, John J..... 1909

Humphreys, George S..... 1910

Kaczoroski, Adolph O..... 1909

Legendre, Joseph Amilcar.... 1891

Levy, William Michael..... 1894

Lyons, Lucien Eugene..... 1904

Metz, Abraham Lewis..... 1887

Sampson, Max..... 1900

Taylor, James Hickey..... 1914

Walker, Joseph Patrick..... 1909

Walsdorf, Edward H..... 1904

Welch, Sister Mary Bernard... 1913

Wirth, Adam, Ph.M..... 1904

Wunderlich, Edward..... 1891

Shreveport.

Peyton, Joe Wharton..... 1914

MAINE.

Auburn.

Burnham, Ralph Foster..... 1904

Jones, Oscar Winthrop..... 1902

Augusta.

Coughlin, John..... 1908

Patridge, Frank Reuben..... 1895

Bangor.

Davis, Charles Howard..... 1903

Sweet, Caldwell..... 1881

Brunswick.

Wilson, Frederick Henry..... 1906

Danforth.

Osborne, William, Jr..... 1913

Porter, Martin Luther..... 1904

Farmington.

Marr, Leon H..... 1912

Fort Fairfield.

Buxton, Horace Childs..... 1910

Gardiner.

Beane, Chester Hunnewill..... 1909

Kennebunk.

Meserve, Albert Wesley, A.M.,
B.A. 1905

Lewiston.

Babcock, Percival Warren..... 1909

Machias.

Crane, Frank Trussell, Ph.G... 1910

Portland.

Cook, Alfred Page..... 1902

Frye, George Carlton..... 1879

Hay, Edward Allston..... 1889

Morse, Frank Dana..... 1902

Schlotterbeck, Augustus George. 1896

Tuttle, George O..... 1907

Sanford.

Wood, William Henry..... 1910

Skowhegan.

Bucknam, Frank William..... 1907

South Poland.

BILLINGS, HENRY MERRY..... 1869

Waterville.

Vose, George Ellery..... 1910

Wilton.

Parlin, Ernest Parkhurst..... 1910

MARYLAND.

MARYLAND

Annapolis.

Leukel, Charles Bernard.....	1902
Pearson, Joseph Frederick, Chief Pharm. U. S. Navy.....	1897
Wood, John William.....	1897

Washington.

Roberts, Joseph Critell.....	1910
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Baltimore.

Base, Daniel, A.B., Ph.D.....	1898
Black, James Aitken, Phar.D....	1910
BRACK, CHARLES EMIL.....	1876
Caspari, Charles, Jr.....	1883
Cook, Parker.....	1910
CULBRETH, DAVID MARVEL REYNOLDS	1883
Daneke, Howard Nelson.....	1907
Dickson, Frederick W.....	1906
Dohme, Alfred Robert Louis...	1891
Dunning, Henry Armit Brown, Phar.D.	1902
ELLIOTT, HENRY ALEXANDER....	1859
Engelhardt, Hermann.....	1907
Feick, Charles.....	1901
Fouch, William M.....	1906
Frames, John Fuller, Ph.G.....	1890
Gilpin, Henry Brooke.....	1889
Hancock, James Etchberger....	1907
HANCOCK, JOHN FRANCIS.....	1863
Hengst, John Edwin.....	1900
Herron, Charles Selburn.....	1911
Heuisler, Philip Ignatius.....	1903
Hodson, Eugene Withers.....	1907
Hynson, Henry Parr.....	1890
Kelly, Evander Frank, Phar..D.	1905
Lowry, William J., Jr.....	1906
Maisch, Henry.....	1898
Mansfield, Samuel.....	1898
Meyer, Charles Lewis.....	1901
Millard, David Rockwell.....	1899
Miller, Clifford O., Phar.D.....	1912
Muth, George Giustiniani.....	1906
Muth, John Clement.....	1898
Muth, John Sebastian.....	1898
Neal, Charles Chaplin.....	1906
Schulze, Louis, Ph.G.....	1892
Schumann, Otto George.....	1902

Shulman, Jacob A.....	1910
Smith, Theodorice.....	1890
Sonnenburg, Charles Edward...	1909
Sullivan, John Patrick.....	1909
Thomas, John Benjamin.....	1906
Waltz, George Harry.....	1914
Walz, Jacob Lee.....	1906
Ware, Charles Howard.....	1898
Werckshagen, Otto.....	1907
Westcott, James Walling, Ph.G.	1890
Whittle, William Aloysius.....	1908
Wich, Henry Edward.....	1909
Williams, Lawrence Soper.....	1910
WINKLEMANN, JOHN HENRY....	1864
Wolf, Charles Augustus.....	1906
Wolf, James Carlton.....	1905
Wolf, Michael Francis.....	1906

Catonsville.

Simon, William.....	1885
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Chestertown.

Stam, Donald Ferguson.....	1910
Toulson, Milbourne Asbury, Ph.G.	1905

Cumberland.

Holtzmann, Charles Hanson...	1911
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Fort Washington.

Simmons, Fred. S.....	1911
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Frederick.

Keller, Jacob Heisely.....	1911
Pearre, Albert Lindsay.....	1906

Frostburg.

Pearce, George Ellsworth.....	1911
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Hagerstown.

Meredith, Harry Lionel.....	1900
Schindel, David P.....	1914

Relay, Baltimore Co.

Hindes, Joseph Frey.....	1910
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Roland Park.

Morgan, Charles.....	1899
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Salisbury.

White, Edward Riall.....	1911
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Snow Hill.

Powell, William Cottingham...	1895
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MARYLAND—MASSACHUSETTS.

Sykesville.

Swain, Robert Lee..... 1909

*Taneytown.*McKinney, Robert Sentman,
Ph.G. 1898

MASSACHUSETTS.

Amherst.

Deuel, C. Fred..... 1907

Arlington.

Murphy, Robert William..... 1911

Beverly.

Delaney, Thomas F..... 1910

Boston.

Ackerman, Adolf Henry,Phar.D. 1910

BASSETT, CHARLES HARRISON,
Ph.G. 1867

Bigelow, Edward Fisher..... 1912

Blake, Harry Wilmarth..... 1909

Boyajian, Nicholas Ernest..... 1913

Bradley, Theodore James..... 1896

Burleigh, Edwin Porter..... 1911

Burnaham, Alfred Augustus, Jr. 1891

Burroughs, Geo. Lawrence,Ph.G. 1910

Cabitt, Harry..... 1909

Carter, Fred. Louis..... 1905

Carter, Frederick Louis, Jr. 1912

DRURY, LINUS DANA, Ph.G. 1871

Finneran, James Francis..... 1906

Flaherty, Patrick J..... 1912

Geddes, Lillian M..... 1912

GODDING, JOHN GRANVILLE,Ph.G. 1875

Godwin, Howard..... 1910

Griffin, Lyman Whiting..... 1907

Hunt, Reid..... 1904

Lyons, Michael Francis..... 1910

McIntire, Martin J..... 1910

Monnier, Ernest..... 1913

Muldoon, Hugh Cornelius, Ph.G. 1913

O'Brien, James M..... 1910

Pierce, William Herbert..... 1879

Sawyer, John R..... 1908

SHARPLESS, STEPHEN PASCHALL,
S.B. 1875SHEPPARD, SAMUEL ARUS DAR-
LINGTON 1865

Shurtleff, Frank Hamilton..... 1914

Smith, Howard Harry, Ph.G.,
M.D. 1911

Staehli, Theodore Hermann.... 1912

Thompson, Leon Albert,Phar.D. 1907

Tobin, John J..... 1914

Vargas, Heredia Jorge..... 1891

West, Charles Alfred..... 1892

Wiggin, Harry Carleton..... 1910

Williams, George Gorham..... 1888

Wooten, Thomas Victor, Ph.G. 1893

Brookline.

Clapp, Lowell Tuckerman..... 1905

Gammon, Irving Parker..... 1906

Hitchcock, Charles H..... 1910

Morey, Arthur C., Ph.G. 1911

Cambridge.

Acheson, William Robert..... 1910

Ford, Charles Mangan..... 1887

Hawthorne, Herman Francis... 1909

LaPierre, Elie Henry, Ph.G.... 1892

McCormick, Peter Joseph..... 1909

Norton, George Edward..... 1895

Stover, Charles Albert, Ph.G... 1909

Woodrow, James Arthur Stir-
ling 1914*Chicopee.*

Dalton, Ernest..... 1913

Concord.

Richardson, Horatio Stillman.. 1892

Dorchester.

Archer, Frederick..... 1913

Connelly, Frederick Wm., Ph.G. 1907

Dorchester Center.

Coleman, George Edward..... 1912

Kelley, Gustavus A..... 1910

Houston, Peter S..... 1914

Tripp, Arthur Horton..... 1906

East Boston.

Packard, Charles Herbert..... 1906

Woodbury, Frank Allen..... 1910

Everett.

Ayers, John R., Jr..... 1914

Wagner, Arthur Carl..... 1907

MASSACHUSETTS.

<i>Fall River.</i>		<i>Melrose.</i>	
Brunelle, Albert Joseph.....	1910	Briry, William S., Ph.G.....	1911
Corrigan, Dominick F.....	1912	Ripley, Henry Milton.....	1910
<i>Fitchburg.</i>		<i>New Bedford.</i>	
Estabrook, Henry Arthur.....	1886	Mackler, Max.....	1913
<i>Fort Warren.</i>		SHURTLEFF, ISRAEL HAMMOND	.1875
Seith, Louis F.....	1912	<i>Newburyport.</i>	
<i>Greenfield.</i>		Davis, Charles Leland, Ph.G...	1897
Walsh, John Francis.....	1914	Goodwin, William Wells.....	1853
<i>Groton.</i>		<i>Newton.</i>	
Bruce, Harry Llewellyn.....	1910	Hubbard, Frederick Arthur....	1907
<i>Holyoke.</i>		Hudson, Arthur.....	1882
Heinritz, Lebrecht Gustav.....	1902	WILSON, BENPAMIN OSGOOD....	1859
<i>Hudson.</i>		<i>Newton Center.</i>	
Toohey, Matthew Frederick....	1911	Hahn, William.....	1910
Wheeler, Carlton Bancroft,		<i>Newton Highlands.</i>	
Pharm.D.	1907	Waterhouse, Joseph Thomas...	1910
<i>Jamaica Plain.</i>		<i>Newton Lower Falls.</i>	
Lewis, Ernest Grant.....	1892	Sears, Carrie Leona.....	1910
Smith, Linville Holton.....	1892	<i>North Cambridge.</i>	
<i>Lawrence.</i>		Olive, George M.....	1911
Call, Harry Burrett.....	1909	Saunders, William Houston,	
Dubrule, Rosaire.....	1909	Ph.C.	1910
Glover, William Henry, Ph.G..	1891	<i>Pittsfield.</i>	
<i>Leonminster.</i>		Bence, Eli.....	1910
Nixon, Charles Frederick, Ph.G.	1900	Engstrom, Ernst Oscar, Ph.G..	1906
<i>Lowell.</i>		<i>Plymouth.</i>	
BAILEY, FREDERICK.....	1869	Cooper, James W.....	1909
Donoghue, Richard Sheridan...	1910	<i>Rosindale.</i>	
HOOD, CHARLES IRA.....	1871	Wicker, Judson A.....	1911
Willson, George Arnold.....	1906	<i>Sagamore.</i>	
<i>Ludlow.</i>		Adams, James Holmes.....	1906
Booth, Albert Edward, Ph.G...	1907	<i>Shelburne Falls.</i>	
<i>Lynn.</i>		BAKER, EDWIN.....	1875
De Coster, Harry Willson.....	1913	<i>Somerville.</i>	
<i>Malden.</i>		Grover, George Elmer.....	1910
Whitaker, William Henry.....	1910	Perry, Henry William.....	1910
<i>Marlboro.</i>		<i>Southborough.</i>	
Barnard, Harry Ames, Ph.G...	1907	Newton, Howard Chamberlain..	1912
<i>Maynard.</i>		Newton, Robert Albro.....	1906
Dwinnell, H. J.....	1912		

MASSACHUSETTS—MICHIGAN.

South Framingham.

Hoey, Charles Edward..... 1913

Springfield.

Leonard, Edward Fenno..... 1909

Lerche, Albert..... 1913

Stoneham.

Currier, Charles O..... 1912

Emerson, Herman Lincoln..... 1911

PATCH, EDGAR LEONARD, Ph.G.. 1872

Taunton.

Crossman, George A..... 1872

Waltham.

Gleason, Patrick Sebastian..... 1904

Hudson, John Robert..... 1910

Waverly.

Burdette, Bernard Clarence.... 1911

Wellesley.

Fitzpartrick, Patrick Joseph.... 1908

West Medford.

Shedd, Edwin Walter..... 1910

West Roxbury.

Sumner, Jennie Henrietta, Ph.G. 1909

West Upton.

Glancy, John Douglas..... 1913

Winchester.

Knight, Frank Herbert, A.B.,
Ph.G. 1909

Wollaston.

Hurlbert, William Alexander... 1909

Worcester.

Brewer, Howard Dickinson.... 1902

Flint, William S..... 1909

Guerin, James Francis..... 1898

Hadley, John Conant..... 1910

MICHIGAN.

Ann Arbor.

EBERBACH, OTTMAR..... 1869

Glover, Clifford C..... 1913

Harvey, Rodney Beecher..... 1913

Hubbard, Winfield Scott, Ph.G.,
B.S., M.A., Ph.D..... 1912

STEVENS, ALVISO BURDETTE.... 1885

Battle Creek.

Goodale, Martin H..... 1910

Cheboygan.

Hugill, Ray A..... 1913

Coldwater.

Lyon, Arthur George..... 1909

Detroit.

Averyt, Henry Madison..... 1907

Briggs, Clifton Henry..... 1914

Elliott, George J..... 1913

Farwell, Oliver Atkins..... 1912

Francis, John Miller, B.S., M.A. 1906

Gorenflo, Oscar William..... 1909

Hall, William Alanson..... 1888

Hamilton, Herbert C., Chemical
Engineer 1912

Hayward, Lawrence Barnes.... 1912

Helfman, Joseph..... 1894

Houghton, Elijah Mark, Ph.C.,
M.D. 1889

Ivanoff, Petko Lazaroff..... 1913

Jackman, Wilbur F..... 1899

Killingsworth, Clarence I..... 1914

Leacock, Walter Gordon..... 1914

LYONS, ALBERT BROWN..... 1885

Mallard, Albert E..... 1907

Mann, Charles Frederick..... 1903

Mason, Harry Beckwith..... 1896

Nelson, Edwin Horatio..... 1904

OHLIGER, LOUIS PHILIP..... 1871

Ohliger, Willard..... 1903

Perry, Frederick William Riley,
Ph.C. 1885

Ryan, Frank Gibbs..... 1892

Scoville, Wilbur Lincoln..... 1891

Seltzer, Leonard Adams, Ph.C. 1899

Stevens, Grant W..... 1910

Strawn, Miss May..... 1912

Taylor, Francis Owen, Ph.C.... 1912

Thompson, Frank Augustus,
Ph. C. 1908

Vernor, James..... 1866

Von Koss, Joseph J..... 1913

Weaver, Clarence Albert..... 1909

Webster, John Hugh, Ph.G..... 1911

Wheeler, Albert Alton..... 1906

MICHIGAN—MINNESOTA.

<i>Eric.</i>	
Moyer, A. E.....	1913
<i>Flushing.</i>	
Sprague, Wesson Gage.....	1895
<i>Grand Rapids.</i>	
Jongejan, Cornelius Henry.....	1910
Kirchgessner, William Carl, Ph.C.	1903
Macdonald, Horace R.....	1910
<i>Ionia.</i>	
Gundrum, George.....	1882
<i>Iron Mountain.</i>	
Seibert, George Frederick.....	1909
<i>Jackson.</i>	
Thome, Edgar R., Ph.D.....	1913
<i>Lansing.</i>	
Shannon, Fern L.....	1910
Todd, Abel Robert.....	1914
<i>Leland.</i>	
Lederle, Archibald L.....	1913
<i>Pontiac.</i>	
Leisenring, Willis.....	1909
<i>Port Huron.</i>	
Rodgers, Edward James.....	1909
<i>Saginaw.</i>	
Heim, Henry.....	1900

MINNESOTA.

<i>Alexandria.</i>	
Holverson, Henry T.....	1909
<i>Clear Lake.</i>	
Eckstein, Andrew Joseph.....	1895
<i>Duluth.</i>	
Abbott, William Allen.....	1901
<i>East Grand Forks.</i>	
Kingman, Ignatius.....	1914
<i>Fergus Falls.</i>	
Beise, John Henry.....	1908
<i>Hopkins.</i>	
Souba, Emil George.....	1911

<i>Lindstrom.</i>	
Elfstrand, Wilhelm.....	1905
<i>Minneapolis.</i>	
Allen, E. Floyd.....	1885
Bachman, Gustav.....	1905
Brewer, Justin Sewall.....	1912
Butters, Charles Hayes.....	1907
Danek, John Francis.....	1895
Erkel, Arthur George, Ph.C....	1910
Gamble, Stewart.....	1897
Griffen, Truman.....	1909
Harrah, John William.....	1910
Haynes, Manley Hewitt.....	1912
Huhn, Charles Hugo, Ph.C....	1905
King, George Alexander Newton	1892
Klenert, Frederick Alois.....	1910
Kulp, George Henry.....	1910
Newcomb, Edwin Leigh, P.D...	1906
Rogers, Charles Herbert.....	1914
Stuart, (Mrs.) Josephine A.	
Wanous	1897
Sweet, William Herbert.....	1905
Thompson, Albert Delano.....	1895
Wulling, Frederick John, Ph.G., LL. B.....	1893
<i>Ortonville.</i>	
Nielson, John.....	1897
<i>St. Paul.</i>	
Baillie, James.....	1912
Bollinger, Clifford H.....	1912
Collier, William Kelly.....	1897
Conger, Frederick Albert.....	1907
Frost, William Arthur, Ph.G...	1892
Jelinek, John Peter.....	1907
McCall, Henry.....	1910
Messing, Richard J.....	1913
Noyes, Charles Reinold, B.A...	1908
Parker, Frederick M.....	1902
Rietzke, Herman W.....	1909
Smith, Frederick Alfred Upsher, Ph.C.	1907
Vennemann, P. Heinrich, Sergt. 1st Cl., H. C., U. S. A.....	1912
<i>Winona.</i>	
Leeb, Theodore Feargod.....	1903
<i>Worthington.</i>	
Morland, Robert Lawson.....	1909

MISSISSIPPI—MISSOURI.

MISSISSIPPI.

Aberdeen, Monroe Co.

Eckford, Joseph William..... 1883

Biloxi.

Stier, Carl, Ph.G..... 1902

Heidelberg.

Lee, Irma Undine..... 1909

Leakesville.

Anding, C. E..... 1914

Meridian.

Kendall, Gus C..... 1913

Port Gibson.

Shreve, John Alexander..... 1880

University.

Faser, Henry Minor..... 1910

Utica.

Simmons, George W..... 1914

Water Valley.

Flake, William Lee..... 1914

MISSOURI.

Bonne Terre.

Armstrong, Clarence Earl..... 1913

Boonville.

Mittelbach, William, Ph.G..... 1891

*Brunswick.*Bowen, Cyrus West, B.S., M.S.,
M.D., Ph.G..... 1912*Cape Girardeau.*Miller, Edwin Alexander, B.Pd.,
Ph.G. 1912

Miller, Isaiah Benjamin..... 1912

Craig.

Cox, Edwin G..... 1914

East Prairie.

Doyle, Robert A..... 1914

Higginsville.

Koppenbrink, Jesse Edmund.... 1913

Jefferson Barracks.

Billups, Charles A..... 1914

Wickett, Francis William..... 1911

Young, George C..... 1912

Jefferson City.

Brandenberger, Adolph..... 1894

Kansas City.

Amos, Wilbur Stanton..... 1903

Crampton, Ferd Leslie..... 1896

Faxon, Henry D..... 1909

Federmann, William Martin.... 1901

Hess, Paul Ludwig..... 1892

Lee, Richard Henry..... 1904

Whitney, David Victory, Ph.G. 1903

Whitney, Minnie M. (Mrs.)... 1914

Wirthman, John George..... 1903

Wirthman, Joseph Charles..... 1903

Zinn, Charles Edward..... 1909

Linn Creek.

Moulder, Bettie Leona..... 1903

*Malden.*Metzger, Arthur Schuh, Ph.G.,
Ph.C. 1903*Mexico, Andrian Co.*Llewellyn, Frederick William,
Ph.G. 1903

LLEWELLYN, JOHN FREDERICK... 1867

Nevado.

Ballagh, Wilfred Thomas..... 1901

Wardin, Ralph Lincoln, Ph.G... 1913

New Madrid.

Hummel, John Andrew..... 1901

St. Joseph.

Bender, Walter Comstock..... 1909

Burvenich, Anton..... 1909

St. Louis.

Bade, William J. F..... 1914

Blakeslee, Louis George..... 1903

BOEHM, SOLOMON..... 1871

Buehler, Carl Theodore..... 1910

Caspari, Charles Edward..... 1902

Claus, Otto Ferdinand, M.D.... 1901

Cloughly, Orval James..... 1913

Collins, George William..... 1911

MISSOURI—MONTANA.

Gaussen, Bettie Prince.....	1910
Dally, Augustus D.....	1913
Falk, John Charles.....	1900
Fricke, Frederick Henry.....	1901
Gietner, Charles, Ph.G.....	1905
Good, JAMES MICHENER.....	1871
Grewe, Louis Frederick, Ph.G..	1901
Hagee, William Price.....	1901
Hagenow, Theodore Frederick..	1901
Hahn, Charles Wm. John Henry	1901
Haines, Frank Allen, Ph.G., Ph.C.	1911
Hemm, Francis.....	1881
Hickey, William Alexander.....	1912
Hoester, Julius C.....	1914
Horton, Charles Henry, Phar.D.	1905
Huegel, Henry Otto Andrew...	1909
Huffman, Bertha Grace.....	1911
Ilhardt, William Kellerman....	1901
Ittner, William Frederick.....	1903
Judge, Charles Rogers.....	1901
Kahre, William Frederick.....	1913
Koch, Albert H.....	1914
Klie, George Henry Charles, Ph.G., M.D.....	1878
Kring, Gustave.....	1912
Kurtz, Irwin William.....	1904
Lang, George, Jr.....	1909
Lehmann, Louis John.....	1911
Lieberstein, Jacob.....	1913
Lieberstein, Louis, Ph.G.....	1909
Lohmann, Garrett S.....	1911
Mackelden, John William.....	1911
MALLINCKRODT, EDWARD.....	1869
Marglous, Lawrence Roscoe....	1912
Meisburger, Wm. J.....	1913
Merrell, George Robert.....	1901
Merrell, Hubert Spencer, Jr., Ph.B., Ph.C.....	1910
Meyer, Theodore Frederick....	1901
Mueller, John Anthony.....	1913
Noll, Martin James, Ph.G.....	1898
Overstreet, William Payne, Ph.G.	1893
Pauley, Frank Charles.....	1879
Ruf, Frank A.....	1913
Schlueter, Robert Ernst, Ph.G., M.D.	1904
Schoenthaler, John Paul.....	1901
Schulte, Arthur Charles.....	1912

Schwerdtmann, Theodore Robert	1913
Seitz, Lorenz Aloysius.....	1901
Sennewald, Emil August.....	1900
Sizemore, Clarence R.....	1911
Smith, Paul W.....	1912
Sommers, George H.....	1913
S'Renco, John Unlf.....	1911
Stolle, Henry Jasper.....	1903
Stuart, Francis Joseph.....	1913
Sultan, Frederick William.....	1901
Suppan, Leo Richard August...	1904
Uhlich, Ferdinand Gottlieb.....	1881
Van Ness, George Ide.....	1904
VORDICK, AUGUST HENRY.....	1874
Walbridge, Cyrus Packard.....	1901
Wall, Otto Augustus.....	1884
WHELPLEY, HENRY MILTON, Ph.G., M.D.....	1887
Wilkerson, Jerome Aloysius....	1911
Willette, Sidney Burke.....	1913
Williams, N. Emery, Ph.G.....	1912
Wolff, Edward Henry.....	1901

Sedalia.

Bard, William E.....	1901
SMITH, OTIS WILMER.....	1903

Webster Grove, St. Louis Co.

Mueller, Ambrose.....	1894
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Windsor, Henry Co.

Wesner, Henry Clay.....	1901
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MONTANA.

Bozeman.

Kraker, John Lewis.....	1912
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Butte.

Jensen, Carroll A. B.....	1914
Rockefeller, Howard.....	1900

Glasgow.

Bromme, William Louis, Ph.G.	1907
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Great Falls.

Woehner, Frederick A.....	1909
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Livingston.

Gross, Schuyler von Rennesslaer	1912
Scheuber, Frank Augustus.....	1905

MONTANA—NEBRASKA—NEVADA—NEW HAMPSHIRE.

Missoula.

Bateman, Herbert Howard.....	1909
Coffee, Sidney J.....	1909
Mollett, Charles Edwin Francis, Ph.C.	1909

NEBRASKA.

Arlington.

Weber, Don Caesar.....	1908
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Auburn.

Dort, Edward Harvey.....	1903
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Brunswick.

Kaester, Frederick George.....	1914
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Central City.

Lock, Herbert.....	1913
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Clarks.

Keefe, Thomas.....	1913
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Clearwater.

Harper, J. Earle.....	1913
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Creston.

Ewing, Samuel E.....	1913
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Crofton.

Cass, Orbia Wilson.....	1914
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Daykin.

Christian, Robert J.....	1911
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Decatur.

Byram, Henry Earle.....	1914
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Fairbury.

Pease, Autumn Vine.....	1893
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Fremont.

Koss, Frank.....	1907
Kreizinger, Karl Ludwig.....	1907

Grand Island.

Brink, Fred Abran, Ph.G.....	1913
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Holbrook.

Butler, Guy.....	1909
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Holdrege.

Fink, Daniel Jacob.....	1903
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Kenesaw.

Mikkelson, Niels.....	1903
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Lincoln.

Haschenburger, Edmund Ommen, Ph.G.	1907
Lincoln, Clarence Shelp.....	1914
Lyman, Rufus Ashley, A.B., A.M., M.D.	1908
Redfern, Ellsworth Lovejoy, B.S.	1913

McCook.

McConnell, Lewis William, Ph.G.	1904
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Neleigh.

Reynolds, Frank E.....	1913
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Oconto.

Jones, Orel, Ph.G.....	1911
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Omaha.

Bexten, Edward William.....	1908
Cermak, Emil.....	1908
Gerald, Herbert Franklin.....	1906
Gering, Henry R.....	1907
Green, James Harvey.....	1912
Lathrop, Charles Edward.....	1910
McEwen, Irving.....	1914
Myers, Preston Brown.....	1897
O'Brien, John Edward, Ph.C....	1913
Piel, Warner A.....	1912
Sherman, Charles Rollin.....	1889
Yates, Edward T.....	1912

Plattsmouth.

Fricke, Frederick George.....	1903
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Tekamah.

Hemping, Harry.....	1914
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Wood River.

Hoye, Daniel J.....	1911
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Wynot.

Schulte, Alexander, Jr.....	1908
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NEVADA.

Elko.

Taber, Joseph Mark.....	1912
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NEW HAMPSHIRE.

Berlin.

Lyford, Earl Howard, B.A., Ph.C.	1903
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NEW HAMPSHIRE—NEW JERSEY.

Manchester.

Knowlton, George Harry..... 1907

Nashua.

Rice, Herbert Eugene..... 1910

Portsmouth.

Grace, William Day..... 1896

Green, Benjamin..... 1888

Somersetworth.

Hurd, John Charles..... 1892

NEW JERSEY.

Bridgeton.

Dare, Charles Ford..... 1889

Jorden, Henry Albert, Ph.G.... 1902

Burlington.

Sparks, Edgar Reed, Ph.G..... 1909

Camden.

Barrett, Charles Llewellyn..... 1902

Beringer, George Mahlon..... 1893

Beringer, George Mahlon, Jr.,

P.D. 1905

Herting, August C..... 1913

Reiser, Philip..... 1913

Weiser, William Peiffer..... 1902

Collingswood.

Vanderkleed, Charles Edwin.... 1902

East Orange.

Hart, William Frank..... 1912

Elizabeth.

OLIVER, WILLIAM MURRAY..... 1875

Schmidt, Henry..... 1904

Stutzlen, Frank Charles..... 1902

Frenchtown.

Harman, Harry M..... 1909

Glen Rridge.

Doolittle, Roscoe Edward..... 1909

Hackensack.

Franck, Adolf..... 1909

Haddonfield.

King, James David..... 1910

Hoboken.

Hostmann, Jeannot..... 1912

KLUSSMANN, HERMANN..... 1876

Ironia.

Coleman, John H..... 1902

Jersey City.

Foulke, James..... 1881

Gallagher, John Charles..... 1893

Lane, John Joseph..... 1909

Jersey City Heights.

Bongartz, Ferdinand Alphonse.. 1905

Kuehne, Charles..... 1902

Kearney.

Shaak, Franklin Philip..... 1906

Keyport.

Warn, William Edgar..... 1886

Linden.

Kraemer, William Charles..... 1914

Maplewood.

Byrnes, Garrett..... 1913

Maywood.

Balmert, Clemens Augustus,

Phar.D. 1909

Medford.

Thorn, Henry Prickett, Ph.G... 1879

Montclair.

Wrensch, Henry Ernst, Jr.,

Ph.G. 1902

Morristown.

CARRELL, EUGENE AYRES.....1875

Mount Holly.

Jones, Edward B..... 1909

Newark.

Bear, Pierce B..... 1905

Dahl, Fred..... 1913

Foster, John Benjamin..... 1901

Hain, Frank Wm. August, Ph.G. 1905

HOLZHAUER, CHARLES..... 1873

Holzhauer, Charles William, A.B.,

Phar.G., Phar.D. 1907

Lamar, William Robinson..... 1901

NEW JERSEY—NEW MEXICO—NEW YORK.

Maltbie, Birdsey Lucius..... 1912
 Marquier, Adolph F., Ph.G..... 1909
 Menk, Charles William..... 1898
 Rusby, Henry Hurd..... 1890
 Scholz, Oscar Robert Bruno.... 1909
 Strauss, David..... 1910

New Brunswick.

KILMER, FREDERICK BARNETT.... 1886

Ocean City.

Gilbert, Cyrus Thurston..... 1913

Orange.

Behrens, John Frederick..... 1908
 SAYRE, EDWARD AUGUSTUS..... 1877

Paterson.

McNeill, William Henry..... 1912

Perth Amboy.

Parisen, George Warren..... 1892
 Seaman, Frederick Anthony.... 1905
 Seil, Harvey A..... 1909

Plainfield.

Armstrong, T. S., Ph.G..... 1912

Rahway.

Frame, A. W..... 1914
 Murray, Benjamin Lindley,
 Ph.C., B.S., A.M..... 1896
 Smith, Joseph George..... 1909

Red Bank.

Van Derveer, Robert Hutchin-
 son 1903

South Orange.

Feindt, Louis E..... 1906

Tenafly.

Bower, Edwin Lawrence..... 1909

Trenton.

Forman, Leroy..... 1913
 Randolph, Raymond Bernard
 Fitz 1912

Union Hill.

Diedrich, Alfred..... 1912

Verona, Essex Co.

Rich, William Pitt..... 1902

Weehawken.

Frank, August, Ph.G..... 1912

West Hoboken.

Maggio, James Innocenzo..... 1907
 Neu, Daniel Alfred..... 1903
 Sieker, Ferdinand August..... 1893

Westfield.

Frutchey, George Watson..... 1909

Woodstown.

Andrews, George M..... 1913

NEW MEXICO.

Albuquerque.

Ruppe, Bernard Charles..... 1908

Ft. Bayard.

Davenport, Jesse St. John, Sgt.
 H. C., U. S. A..... 1914

Fort Stanton.

Irwin, Charles H..... 1913

East Las Vegas.

Murphey, E. G..... 1909

Sante Fe.

Fischer, Adolph Jacob, Ph.G.... 1910

Socorro.

Hilton, Emily K. (Mrs.)..... 1913

NEW YORK.

Albany.

Bradt, Warren Lansing..... 1903
 Dillenbach, Garrett Van der Veer 1902
 Michaelis, Gustavus, Ph.G..... 1882
 Taylor, Henry Lewis, A.B., A.M.,
 Ph.D. 1906

Alexandria Bay.

Zoller, Glenn M..... 1914

Auburn.

Adams, Arthur Ellison..... 1902
 Bower, Stratton Valley..... 1914
 Sears, Charles Barager..... 1906

Bronxville.

Smith, William Humphrey, Ph.G. 1912

NEW YORK.

Brooklyn.

Anderson, William Christine, Ph.G., Phar.D.	1900
Bartley, Elias Hudson	1893
Cantor, Lorentz, Ph.G.	1907
Caruso, Joseph	1914
Coblentz, Virgil	1882
Creagan, William Thomas	1912
DeJonge, Cornelius	1899
Dewender, William Henry	1896
Diehl, August	1909
Diekman, Clara Ada	1912
Dissosway, Thurston N., Ph.C.	1905
Dodge, Francis Despard	1910
Duerr, George John	1910
DUNN, JOHN AUGUSTUS	1867
Eccles, Robert Gibson, M.D.	1885
FOULGER, EDMUND CHARLES HENRY	1890
Frye, William E.	1913
Gardner, Alexander, Ph.G.	1910
Harvey, William Arthur	1913
Heimerzheim, Eugene	1914
Hereth, Frank Samuel	1893
Hoffman, Edward, Ph.G.	1914
Holmes, Ralph Cerele	1912
Lohness, Archie Percival	1913
Maines, Eugene L.	1912
Mayo, Caswell Armstrong	1893
McELHENIE, THOMAS DEARM OND, Ph.G.	1872
Millikin, Joseph Pancoast	1914
Raubenheimer, Otto, Ph.G.	1902
Raymow, Thomas F.	1913
Rehfuss, Jacob H.	1913
Rosenzweig, Benjamin	1898
Schaak, Milton Franklin	1906
Schaefer, Hugo Herman	1913
Schwartz, Israel	1914
Snyder, Ambrose Chancellor	1867
Turner, Joseph L.	1914
Tuthill, Frederick Percival, Ph.G., Phar.D.	1899
Westheimer, David	1912
Wyckoff, Elmer Ellsworth	1906
Yaffa, David Benjamin	1913

Buffalo.

Bentz, Henry George	1904
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Dimond, Harry John	1904
Gregory, Willis George, M.D., Ph.G.	1886
Handy, John Abner	1914
Hayes, Horace Phillips	1880
Lock, Frank E.	1910
Lockie, Peter M.	1911
Menzies, John William	1911
Morgan, Richard Franklin	1914
Polonsky, Evel	1914
Reimann, George	1902
Roehrig, Albert Michael, Ph.G.	1902
Stoddart, Thomas	1900
Whelan, William Farrar	1911
White, Forest E.	1913

Cambridge.

Richardson, Frank, Ph.G.	1906
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Catskill.

DuBois, William Laneman	1880
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City Island.

Alpers, Otto C.	1913
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College Point.

Hartz, Johann Daniel August ..	1902
Klein, Edward Nicholas Emil, Ph.C.	1905
Meyer, Samuel	1914

Corning.

Cole, Victor Le Roy	1880
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Dannemora.

Sloss, Robert Audley	1901
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Delmar.

Huested, Alfred Birch	1879
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Dunkirk.

Davis, Eugene Miller	1892
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Ellis Island.

Macdowell, William Foster	1904
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Elmira.

HOLMES, CLAYTON WOOD	1873
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Flushing.

HEPBURN, JOHN	1873
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Fort Slocum.

Winkler, Hugo	1913
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NEW YORK.

Fort Terry.

Gerlach, John L..... 1911

Governor's Island.

Robertson, David, Sgt. 1st Cl. H.
C., U. S. A..... 1912

Hudson.

Wardle, Arthur Stanley..... 1910

Kingston.

Dedrick, William Frederick..... 1914
McBride, Charles Luther..... 1910

Little Falls.

Hurley, John..... 1909

Middletown.

Rogers, Fred Schwartz..... 1914
ROGERS, WILLIAM HENRY..... 1869

Monticello.

Isakovics, Alois von..... 1903

Mount Vernon.

Horstmann, Gustave..... 1914
Nicholas, J. J..... 1913
Stone, Clarence George, Ph.C... 1901

New York.

Allison, William O..... 1895
Army, Harry V., Ph.G., Ph.D... 1891
Ballard, Charles William, Ph.C.,
Phar.D., M.A..... 1908
BALSER, GUSTAVUS..... 1875
Beilstein, Christian..... 1907
Berger, Louis, Ph.G..... 1907
Bernard, Pierre Arnold..... 1914
Bigelow, Clarence Otis..... 1900
Bilhuber, Ernst..... 1912
Boeddiker, Otto..... 1895
Brickelmaier, Paul H..... 1913
CHANDLER, CHARLES FREDERIC... 1867
Cohn, Alfred I..... 1905
Colle, Bernard..... 1911
Conyngham, William Boulton.. 1909
Daggett, Volney Chapin..... 1901
Darling, Joshua Ferris..... 1909
Diekman, George Charles..... 1898
Diner, Jacob, Ph.G..... 1906
Erhart, William Hermann..... 1907
Euler, C. G..... 1913
FAIRCHILD, BENJAMIN THOMAS. 1875

Fairchild, Samuel William..... 1887
Fankhauser, William..... 1913
Ferguson, George Albert, B.P.. 1905
FRASER, HORATIO NELSON, Ph.G.,
Ph.M., M.D..... 1888
Fried, Leopold H..... 1914
Gane, Eustace Harold..... 1895
Gay, St. Claire Ransford (Mrs.) 1914
Geisler, Joseph Frank..... 1889
Githens, Thomas Stotesbury... 1909
Hamann, William Augustus... 1907
Harris, Harry L..... 1913
Hatcher, Robert Anthony..... 1905
HAYNES, DAVID OLIPHANT..... 1887
Henning, Adolph..... 1905
Hohmann, George..... 1910
Holliday, Francis Emlen..... 1900
Hopkins, Jesse L..... 1898
Hudnut, Richard Alexander... 1899
Kalish, Oscar G., Ph.G..... 1900
Kantor, Morris, Ph.G..... 1912
Kantrowitz, Hugo..... 1907
Kemp, Edward..... 1903
KENNEDY, EZRA JOSEPH..... 1887
Kirchgasser, Wm. Charles, Ph.G. 1888
Kleinau, George..... 1911
Klingmann, Albert..... 1910
Klingmann, Otto..... 1913
Koch, William Julius..... 1907
Koplowitz, Barnet..... 1911
Lampa, Robert Raymond..... 1892
Lascoff, Jacob Leon..... 1903
Latham, Thomas..... 1907
Lehman, Robert Seel..... 1910
Lovis, Henry Christian..... 1892
Luft, George W..... 1913
MAIN, THOMAS FRANCIS, Ph.G. 1872
Maisel, Joseph..... 1908
Major, Alphonse..... 1913
Mansfield, William..... 1907
Mayer, Joseph L..... 1905
McCartney, Frank Leslie, Phar.D. 1907
McINTYRE, EWEN, JR..... 1903
McKesson, Donald, B.A..... 1906
McKesson, George Clinton..... 1888
McKESSON, JOHN, JR..... 1867
Metz, Herman A..... 1910
Myerson, Isaac Aaron..... 1906
Nevin, Thomas..... 1912

NEW YORK.

Oats, Henry Edward.....	1911
Oefele, Baron Felix von.....	1912
O'Neil, Henry Maurice.....	1879
Pickhardt, Elsa Grace (Miss) ..	1913
Pierson, Romaine.....	1913
Plant, Albert.....	1894
Quackenbush, Benjamin Franklin	1886
Riefflin, George T.....	1909
Riley, John A.....	1913
Rippetoe, John Ross, P.D.....	1907
Roediger, Louis Frank, Ph.G...	1909
RUNYON, EDWARD WHEELOCK...	1875
Sahm, Louis Napoleon.....	1905
Scavo, John, Ph.G., Ph.C., Phar.D.	1912
Schenck, Henry.....	1903
Schieffelin, William Jay.....	1892
Schimpf, Henry William.....	1894
Schlicke, Carl Paul.....	1913
Schnell, Harry Julius.....	1906
Schweinfurth, George Edward..	1907
Scott, Harry.....	1907
Sher, Edward.....	1911
SKELLY, JAMES JOSEPH.....	1866
Spring, George Alexander.....	1907
Takamine, Jokichi.....	1898
Timmermann, Richard Herman	1909
Tocco, Orazio.....	1910
Tucker, Thomas Harold.....	1912
Velsor, Joseph A.....	1913
Wall, John Richland.....	1912
Weil, Jacob.....	1913
Weinstein, Joseph, P.D., Pro- visor Imp. Univ. Moscow, Russia	1905
Weiss, Emil Otto.....	1907
WICKHAM, WILLIAM HULL.....	1870
Wimmer, Curt Paul.....	1907
Wooyenka, Keizo.....	1907

Niagara Falls.

Ulrich, Richard Joseph.....	1914
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Norwich.

Windloph, J. Fred.....	1913
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Port Washington.

Roon, Leo.....	1913
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Queens, L. I.

Niece, Frederick Ellwood, Ph.G., Phar.D., Chem.Gd.....	1903
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Richmond Hill, L. I.

Stephenson, John Joseph.....	1905
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Rochester.

Guilford, Harry Bennett.....	1912
Hyde, Byron M.....	1908
Schlotterbeck, Julius Otto.....	1888
Smith, J. Hungerford.....	1913

Salamanca.

Krieger, John Christian.....	1903
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Saratoga Springs.

Cramer, Louis.....	1914
Fish, Charles Frederick.....	1866

Sayville.

Thornhill, Sewell.....	1909
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Sheepshead Bay.

McMahon, Joseph.....	1897
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Springfield, L. I.

De Forest, William Pendleton..	1879
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Stapleton, Staten Island.

Stearns, William Lincoln, Ph.G.	1903
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Syracuse.

Cummings, Wm. Leon.....	1914
DAWSON, EDWARD SEYMOUR, JR.	1876
Muench, Albert August.....	1914
Muench, William.....	1899
SNOW, CHARLES WESLEY.....	1876
Stolz, David.....	1911

Tottenille.

Lehman, Charles Norton.....	1909
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Upper Red Hook.

Lamb, John Amos.....	1909
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Utica.

Evans, Arthur S.....	1907
Slauson, John Gordon.....	1907
Watson, William, Jr.....	1902

White Plains.

Roemer, John, O.P.....	1910
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Yonkers.

Petsche, Franz, Friedrich Bis- marck Wilhelm	1892
Schlesinger, Leopold Joseph....	1912

Youngstown.

Owen, Fred S.....	1911
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NORTH CAROLINA—NORTH DAKOTA—OHIO.

NORTH CAROLINA.

Bryson City.

Bennett, Kelly Edwin..... 1913

Chapel Hill.

Beard, John Groves..... 1914

Howell, Edward Vernon..... 1900

Charlotte.

Stowe, James Pinkey..... 1914

China Grove.

Swaringen, DeWitt Clinton..... 1905

Fayetteville.

Horne, Warren Winslow, Ph.C. 1902

Goldsboro.

Hicks, John Elias Faison..... 1910

Lumberton.

McDonald, John Stedman..... 1914

Morgantown.

Greyer, Charles Peyton..... 1912

Oxford.

Hays, Francis Banks..... 1902

Rocky Mount.

Rose, Ira Winfield, Ph.G..... 1912

Tarboro.

ZOELLER, EDWARD VICTOR..... 1878

Tryon.

Missildine, Ernest Ellwood, A.B. 1910

Wilmington.

Hardin, John Hapwood..... 1881

Wilson.

Tarkenton, Edward Lawrence.. 1912

NORTH DAKOTA.

Abercrombie.

Ware, Clarence Walter..... 1907

Agricultural College.

Schlichting, Arthur Floyd..... 1913

Bismarck.

Finney, Burt..... 1909

Fargo.

Bentson, Bernard Leo..... 1909

Porterfield, Wm. Perry, Ph.G... 1909

Zieffe, Adolph..... 1910

Grafton.

Haussamen, Henry Louis, Ph.G. 1906

Lisbon.

Parker, William Stillman..... 1909

Willow City.

Master, Walter..... 1909

OHIO.

*Ada.*Mohler, David Christian, Ph.G.,
Ph.L. 1906*Akron.*

Davis, Ernest C., Ph.C..... 1913

Arcanum.

Hoffmann, Charles O..... 1913

Barnesville.

Ely, Ernest Sykes..... 1904

Beach City.

Goudy, Earl Edw..... 1914

Bellevue.

Brinker, John Henry..... 1906

Bluffton.

Hauenstein, Sidney..... 1913

Cambridge.

Schlup, Samuel, Jr..... 1908

Canton.

Hannan, Owen Burdette..... 1893

Portmann, Leo Edward..... 1912

Schlabach, Edward John..... 1904

Stanbarger, Morris Howard.... 1906

Chillicothe.

Howson, Arthur Bagshawe..... 1886

Cincinnati.

Apmeyer, Charles Ascau..... 1906

Buckert, Peter Robert..... 1913

De Courcy, Lydia..... 1913

Diehl, Charles..... 1913

OHIO.

Fack, Rudolph.....	1913
Fennel, Charles Theo. P., Ph.G., Ph.D.	1886
Freericks, Frank Herman, Ph.G., L.L.B.	1905
Greyer, Julius.....	1880
Harding, Charles F.....	1913
Heinemann, Edwin.....	1913
Heister, Louis.....	1914
Herman, Peter E.....	1913
Jones, Harold W.....	1913
Katz, Otto.....	1904
Kohl, J. Otto.....	1913
Kotte, Fred S.....	1913
Kutchbaugh, John Frederick, Ph.G.	1904
Lakamp, William.....	1913
Lindeman, Edward.....	1913
LLOYD, JOHN URI.....	1870
Merrell, Charles George, S.B..	1888
Merrell, George.....	1897
Minster-Ketter, Frederick John.	1913
Morgan, Samuel.....	1914
Otis, John C.....	1913
Ott, Bertha (Miss).....	1913
Schmuelling, H. G.....	1913
Southard, Frank Allen, Ph.G...	1903
Thiesing, Edward Henry.....	1912
Vester, John W.....	1913
Voss, Edward, Jr.....	1904
Weik, John.....	1913
Weissmann, Charles.....	1914
Werner, Louis.....	1913
Wetterstroem, Theodore David.	1897
YORSTEN, MATTHEW MACKAY...	1864
Zuenkeler, John Ferdinand, Ph.G.	1887
Zwick, Albert Otto.....	1912

Circleville.

Fickhardt, Frederick Lutz.....	1904
Teegarden, Gilbert A.....	1913

Cleveland.

Alpers, William Charles.....	1890
Benfield, Charles William.....	1893
Cobb, Ralph Lathrop.....	1883
Feil, Joseph.....	1885
Flandermeyer, August Louis, Ph.G.	1910

Fox, Willard Milton.....	1903
Hankey, William Tabor.....	1902
Hechler, Edward Henry.....	1904
HOPP, LEWIS CHRISTOPHER.....	1876
Maguire, Edward Sylvester, Ph.G.	1897
Muhlhan, Otto Emil.....	1905
Placak, Harry, Ph.G.....	1902
Rahn, Earl William.....	1913
Reed, James Garfield.....	1909
Schellentrager, Ernest August..	1906
Schoenhut, Christian Henry....	1888
Selzer, Eugene Reinhold, Ph.C.	1893
Sherwood, Henry Jackson.....	1894
Sollmann, Torald.....	1908
Sords, Thomas Vincent.....	1893
Treadon, Walter J.....	1913
Winter, Carl.....	1910
Woolsey, Jesse Francis.....	1910

Columbus.

Ackerman, Philip Jacob.....	1906
Bagley, Anna Gertrude.....	1912
Dye, Clair Albert.....	1901
Ford, Myron Nile.....	1912
Franklin, Peter P.....	1912
Harp, Lewis D., Sergt. H. C., U. S. A.....	1911
Hansen, Matthew Kjoss.....	1911
Harrington, Edward W.....	1913
Harrington, Frank.....	1869
Hatton, Ellmore Wright.....	1894
Herpich, John Le Dure.....	1906
Johnson, Robert V.....	1913
Kaemmerer, William Frederick.	1899
Kauffman, George Beecher.....	1882
Marckworth, Otto Stanley.....	1913
Marshall, Ernest Clifton.....	1910
Sauerbrun, Otto Orville.....	1905
Schueller, Frederick William...	1880
Spease, Edward, B.Sc., Ph.C....	1912
Topping, George Ballard, Ph.C.	1913
Webb, Edward Nathan.....	1905
Wendt, William Carl.....	1901

Dayton.

Jenkins, Elizabeth (Miss).....	1913
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East Liverpool.

Benedum, Ralph C.....	1913
Holloway, Jesse Daniel, Ph.C..	1905

OHIO—OKLAHOMA—OREGON.

Elyria.
Craine, Percy P..... 1908

Grand Rapids, Wood Co.
THURSTON, AZOR..... 1886

Mansfield.
Ashbrook, Charles Shaw..... 1910

Massillon.
Lieber, Carl Jewel..... 1914

Norwood.
Brittain, William Leo Broadup. 1913

Pomeroy.
Reed, Curtis, Darius..... 1913

Portsmouth.
Amann, Frank..... 1914

Sandusky.
Biehl, Lewis A..... 1908

Scio.
Beal, James Hartley..... 1892
Creighton, Mary L (Miss)..... 1903
Starkey, Harley Dale..... 1913

Sidney.
Christian, F. D..... 1913

Springfield.
SIEGENTHALER, HARVEY NEWTON 1882

Toledo.
Bowman, Waldo Moffett..... 1903
Ludwig, William Edward..... 1904

Troy.
Tobey, Charles William, Ph.G. 1909

Twinsburg.
Stingel, Jacob Leroy..... 1909

Youngstown.
Cassaday, Orlin Ulysses..... 1899

OKLAHOMA.

Atoka.
Lewis, Theodore Cuyler..... 1911

Caddo.
Dodd, William F..... 1909

Enid.
Dodson, Carl M..... 1914

Ft. Sill.
Sharman, Herbert, Sergt. 1st Cl.
H. C., U. S. A..... 1913

Guthrie.
Lillie Foress Ball..... 1900

Hennessey.
Dinkler, Frank Adam..... 1900

Luther.
McCutchen, William Henry,
Ph.C. 1913

Madill.
Rollins, William Cleveland..... 1914

Norman.
De Barr, Edwin..... 1905

Nowata.
Brunk, L. D., Jr..... 1914

Pond Creek.
Dow, Charles Asher..... 1909

Stroud.
Burton, John Clement..... 1902

Weatherford.
Hudelson, F. H..... 1914

OREGON.

Albany.
Woodworth, D. Olin..... 1914

Corvallis.
McKellips, Clarence..... 1909
Seeley, Milton J..... 1914

Grants Pass.
Slover, James Anderson..... 1909

Marshfield.
Brown, James Lee, Ph.G..... 1903

North Bend.
Everitt, Miles Ellsworth..... 1909

Parkdale.
Nelden, Ralph..... 1908

OREGON - PENNSYLVANIA.

Portland.

Byerley, Fabian.....	1909
Chapman, Thomas A.....	1914
Clarke, Louis Gaylord.....	1909
Crysler, Ralph.....	1909
Gradon, Walter Allen.....	1909
Haack, Ludolph George.....	1909
Koehler, William Francis.....	1909
Laue, John Max Alfred.....	1904
McMillan, Daniel Newcomb,	
Ph.G.	1909
Miller, Wm. Louis, Ph.G.....	1910
Rein, Tania.....	1910

Salem.

Harbord, Kittie Walker, Phar.D.	1905
Paul, George Harrison, Sergt.	
1st Cl. H. C., U. S. A.....	

Silverton.

Johnson, Lewis.....	1909
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The Dalles.

Blakeley, George Clarence.....	1892
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PENNSYLVANIA.

Allegheny City.

Sample, Oliver Hazen.....	1907
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Altoona.

Simpson, William Monroe.....	1914
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Ambler.

Mattison, Richard V., M.D.....	1913
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Ambridge.

Freymark, Geo. Fred.....	1913
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Bellwood.

Grauer, Norman Albert.....	1909
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Brackenridge.

Chapman, Joseph T.....	1910
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Braddock.

Bumbera, Joseph Edward.....	1913
Czyzewski, Blasius Joseph.....	1909
Kutscher, George William.....	1905
Reichert, Louis, Jr.....	1910

Bryn Mawr.

Winslow, Edward Fayssoux....	1910
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Carlisle.

HORN, WILBUR FISK.....	1876
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Carrick.

McNulty, James Cleland.....	1909
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Castle Shannon.

Doyle, Joseph Jesse.....	1909
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Coal Dale.

Hoffman, John Irwin.....	1914
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Columbia.

Zeamer, Harry Wisler.....	1905
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Conemaugh.

Robak, William Nicholas, Ph.G.	1912
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Curwensville.

Kirk, Frank Hall.....	1907
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Du Bois.

Hay, Charles La Mar.....	1898
Simmons, Joseph A.....	1913

Duquesne.

Kovacs, Samuel Solomon.....	1912
Pietkiewicz, Wladyslaw Lion...	1908

East Downingtown.

Tyson, Jesse Scholl.....	1913
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Easton.

Anspach, Paul Bucher, Ph.G....	1903
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Ebensburg.

Davis, Elden Barker.....	1913
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Eddystone, Delaware Co.

MORRIS, LEMUEL IOWORTH.....	1880
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Elkins Park.

Osborne, Melmoth Mercer.....	1906
------------------------------	------

Ford City.

Rihn, Edward John.....	1913
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Greencastle.

Carl, Charles Blair.....	1910
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Grove City.

DeFrance, George W.....	1910
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PENNSYLVANIA.

Harrisburg.

GEORGE, CHARLES THEODORE..... 1873
 GORGAS, GEORGE ALBERT..... 1884
 Kramer, Charles F..... 1910
 Smith, Benjamin Franklin..... 1892

Hatboro.

Rothwell, Walter..... 1907

Haverford.

Harbaugh, Wilson Linn..... 1896

Homestead.

Wohlfarth, Walter Francis..... 1913

Houtzdale.

Arnold, William Charles..... 1908

Huntingdon.

Wolff, Daniel Oliver..... 1909

Indiana.

Houck, David Lee..... 1909

Johnstown.

Griffith, Charles..... 1900

Kingston.

Lohmann, John..... 1904
 Pegg, Harry Wilson, Ph.G..... 1908

Lancaster.

Frailey, William Otterbein..... 1903

Lebanon.

LEMBERGER, JOSEPH LYON, Ph.G.,
 Ph.M. 1858

Lock Haven.

Heffner, Edgar F..... 1911

Manheim, Lancaster Co.

Ruhl, Harry Fry..... 1902

McKeesport.

Lundgren, Ludwig Alexander,
 R.S. 1913

McKees Rocks.

Sandles, Van Amburg..... 1909

Meadville.

Utech, Philip Henry, Ph.G..... 1907

Monessen.

Firk, William Palmer..... 1913

New Castle.

Burckart, William Edward..... 1914
 Wallace, John Crawford,
 Phar.D. 1905

Norristown.

Worthington, John Warren
 Wolfe 1912

Norwood.

Borneman, John A..... 1913

Ogontz.

Clayton, Abram Theophilus.... 1906

Oil City.

Gaddess, John..... 1908
 Tyler, Roy Ellis..... 1914

Philadelphia.

Apple, Franklin Muhlenberg,
 Ph.G., Phar.D..... 1905
 Baer, Jacob Michael..... 1902
 Blackwood, Russell Thorn..... 1907
 Blair, Henry Cowan..... 1907
 BORING, EDWIN McCURDY 1867
 Brinton, Clement Starr..... 1907
 Busch, Henry Paul..... 1910
 Busch, Miers..... 1903
 Cadmus, Robert Clark..... 1906
 Campbell, Milton..... 1902
 Campbell, Theodore..... 1902
 Carpenter, William Asbury..... 1910
 Cliffe, William Lincoln..... 1898
 Cook, E. Fullerton, P.D..... 1901
 Cope, Frank Henry..... 1909
 Cuthbert, William Richard..... 1906
 Decker, Robert William..... 1907
 England, Joseph Winters..... 1893
 Evans, George Bryan..... 1902
 Ferguson, James A..... 1913
 Fischelis, Robert Phillip, Ph.G.,
 Ph.C., B.Sc..... 1911
 FOX, PETER PAUL..... 1869
 French, Harry Banks..... 1890
 French, Howard Barclay..... 1906
 Gabell, Cromwell Pearce, Ph.G. 1907
 Gano, William Hubbell, Ph.G.. 1892
 Garvey, James Aloysius, P.D... 1909
 Gordon, Frederick Troup, BS.,
 Ph.C. 1911

PENNSYLVANIA.

Griffen, Willard.....	1902	Morgan, Frank E., Ph.G., Phar.D.	1906
Griesemer, Lloyd P.....	1913	Nebig, William George, Ph.G....	1907
Hance, Anthony Miskey.....	1902	Osterlund, Otto William.....	1902
HANCE, EDWARD HANCE.....	1857	Ostrum, Hyman W.....	1914
Harbold, Curtis Alexander.....	1907	OTTINGER, JAMES JEREMIAH.....	1876
Hassinger, Samuel Ellphat Reed	1880	Pachali, Theodore, Jr.....	1907
Hausmann, Frederick William.	1895	Peacock, Bertha Leon (Mrs.), Ph.G.	1895
Haydock, Susannah Garrigues..	1905	Peacock, Josiah Comegys, Ph.G.	1892
Helm, William Joseph.....	1902	Pearson, William Alexander....	1908
<i>Heutzelman, Joseph Augustus.</i>	1858	Pfeiffer, Gustavus Adolphus....	1910
Henry, Samuel Clements.....	1909	Pittenger, Paul Stewart, Ph.G., Ph.C., Phar.D.....	1911
Hessler, Elmer H.....	1914	Poley, Warren Henry.....	1906
Hoch, Quintus.....	1907	Pollard, August Torrey.....	1906
Hughes, Francis Stacker.....	1902	Rehfuss, Charles.....	1908
Hummel, Joseph E.....	1914	REMINGTON, JOSEPH PRICE.....	1867
Hunsberger, Ambrose.....	1905	Roberts, John Griffith.....	1914
Kahn, Solomon Karl.....	1905	Roessner, Benjamin, Phar.D....	1912
Kercher, Edwin Harry, Ph.G....	1907	Rosengarten, Adolph G.....	1913
Kimberly, Chas. Hubbell, B.Sc., M.Sc., Phar.D., Ph.D.....	1908	Rosengarten, Frederick.....	1913
Kirby, Charles P.....	1909	Rosengarten, George David.....	1902
Kirk, Samuel Bird.....	1907	Rosengarten, J. G.....	1913
Kline, Clarence Mahlon, Ph.B..	1902	Rosin, Joseph.....	1914
Klopp, Henry L.....	1913	Sadtler, Samuel Philip.....	1893
Kohler, Charles.....	1913	Seidman, Harry.....	1911
KRAEMLER, HENRY.....	1892	SHOEMAKER, RICHARD MARTIN..	1865
Lacey, William Henry.....	1907	Siegfried, Howard J.....	1907
Lackey, Richard Henry.....	1907	Simmel, Martin.....	1911
Lantz, William Henry.....	1908	Simpson, Robert.....	1913
LaWall, Charles Herbert, Ph.M.	1896	Smith, Howard E.....	1910
LaWall, Millicent Renshaw (Mrs.), P.D.....	1905	Smith, Walter Valentine.....	1902
Lee, William Estell, Ph.G.....	1905	Staudt, Albert John.....	1907
Leedom, Charles.....	1902	Stewart, Francis Edward.....	1884
Levin, David.....	1913	Streeper, Frank Park.....	1907
Lowe, Clement Belton, Ph.B., Ph.G., M.D.....	1895	Stroup, Freeman Preston, Ph.M.	1900
Matusow, Harry, Ph.G.....	1897	Sturmer, Julius William, Ph.G., Phar.D.	1901
McNeil, Robert.....	1907	Thum, John Karl, Ph.G.....	1905
Meade, Harold Barr.....	1910	Wallace, George R.....	1914
Meeker, George Herbert, B.S., M.S., Ph.D., Phar.D., D.D.S..	1905	WEIDMANN, CHARLES ALEXAN- DER, Ph.G., M.D.....	1868
<i>Mellor, Alfred.....</i>	1864	Weisner, Nicholas Frederick...	1909
MILLER, ADOLPHUS WILLIAM, Ph.G., M.A., I H.D.....	1868	White, Robert Walter, Ph.G....	1911
Minehart, John Roy.....	1905	Wood, Horatio C., Jr., M.D....	1906
Moerk, Frank Xavier, Ph.G., Ph.M.	1898	Youngken, Heber Wilkinson, A.B., A.M., Ph.G.....	1912

PENNSYLVANIA—PHILIPPINE ISLANDS.

Pittsburgh.

Alvino, Ernest Eugenio.....	1910
Black, Perry Newton.....	1914
Blumenschein, Frederick John..	1904
Calhoun, Will M.....	1908
Campbell, Andrew.....	1909
Darbaker, Leasure Kline, Ph.G., Phar.D.	1909
EMANUEL, LOUIS.....	1878
Erskine, George Walker.....	1909
Gilleland, John Roy.....	1914
Glockler, B. E.....	1914
Janda, Thomas John Joseph....	1913
Judd, Albert Floyd.....	1901
Koch, Julius A.....	1892
Kossler, Herman Stanislaus....	1905
Kretz, Edward John.....	1909
Kuenzig, Peter A.....	1913
Lohmeyer, Henry L.....	1910
McMonigle, David Ralph.....	1913
Michalski, John Stanislaus....	1913
Mierzwa, Richard.....	1908
O'Brien, James Stanley.....	1912
Pritchard, Benjamin Elliott....	1908
Rodemoyer, William Edward...	1901
Saalbach, Carl, Ph.G.....	1908
Saalbach, Louis, Ph.G., Phar.D.	1907
Schaefer, Charles Henry, Ph.G.	1909
Schaefer, Emil August, Phar.D.	1900
Stiefel, Albert Frederick.....	1909
Szykowny, Thomas Joseph.....	1912
Thompson, John Reynolds.....	1905
Walley, Charles Elmer.....	1912
Walter, Peter Grant, Ph.G., Phar.D.	1905
Wurdach, John Herman.....	1909
Young, Harry Garfield.....	1913

Pittston.

Stroh, George D.....	1914
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Plains.

Merritt, Henry W.....	1913
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Pottsville.

Deibert, Thomas Irwin.....	1882
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Reading.

Ziegler, Howard Philip.....	1905
ZIEGLER, PHILIP MILTON.....	1867

Rochester.

Hamilton, Mary R. (Miss)....	1914
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Scranton.

Knoepfel, William Henry.....	1909
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Sewickley.

Minesinger, Norman Wilhelm..	1906
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Springdale.

Blank, Herman Gustave.....	1905
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Sutersville.

Miller, Lawrence J., Ph.G.....	1913
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Toxwanda.

PORTER, HENRY CARROLL.....	1872
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Warren.

Talbott, W. A.....	1913
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Washington.

McConaughy, Thomas Singleton	1905
Vowell, Louis Sweitzer.....	1905

Wayne.

Mulford, Henry Kendall.....	1896
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Wilkinsburg.

Truby, Grace Miriam (Miss)...	1914
Wambaugh, Charles Raymond..	1913

Williamsport.

CORNELL, EDWARD AUGUSTUS, Ph.C.	1873
Milliner, William S.....	1905
Walton, Lucius Leedom, Ph.G., Ph.M., Phar.D.....	1904

Woodlawn.

Bryson, William Smith, Ph.C., M.D.	1905
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York.

Harbold, John Tilden.....	1905
Leber, Jacob Gilbert.....	1905
Patton, John Franklin.....	1880

PHILIPPINE ISLANDS.

Albay.

Thomas, William H., Sergt. 1st Cl., H. C., U. S. A.....	1912
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Batangas

Cook, Samuel, Sergt. 1st Cl H. C., U. S. A.....	1912
Hicks, George William.....	1912

PHILIPPINE ISLANDS.

Bayambang.

Elcook, William Wallace..... 1911

Benguet.

Gousey, Gilbert H..... 1913

Camp Avery.

Montgomery, Moses, Sergt. 1st
Class, H. C., U. S. A..... 1913

Camp Stansburg, Campanga Prov.

Hahn, Gustave, Sergt. 1st Cl.
H. C., U. S. A..... 1912

Cavite.

Reiter, Harry L., Sergt. 1st Cl.
H. C., U. S. A..... 1911

Corregidor.

Fancher, William Q., Sergt. 1st
Cl. H. C., U. S. A..... 1913
Goodman, David, Sergt. 1st Cl.
H. C., U. S. A..... 1913
Hare, Ralph E., Hospital Corps 1914
Ilitz, Michael, Sergt. 1st Cl. H.
C., U. S. A..... 1913
Jeen, Elmer, Sergt. 1st Cl. H.
C., U. S. A..... 1913
Marcus, Samuel, Sergt. 1st Cl.
H. C., U. S. A..... 1914
Nelson, Rasmus Peter..... 1914

Davao, Mind.

McEnroe, Robert Lynch, Sergt.
1st Cl. H. C., U. S. A..... 1912

Fort Mills, Corregidor.

Both, Harold, Sergt. H. C., U.
S. A..... 1913
McFarland, William..... 1914
Parker, Hiram Carney..... 1912
Pye, Harry E..... 1913
Fort William McKinley, Rizal.
Arias, Ernest, Sergt. 1st Cl. H.
C., U. S. A..... 1913
Dickson, Robert Alexander, Sgt.
1st Cl. H. C., U. S. A..... 1914
Eisenman, Francis Joseph, Sgt.
1st Cl. H. C., U. S. A..... 1912
Greene, Earl F., Sergt. 1st Cl.
H. C., U. S. A..... 1913

Lienhart, Adolph H., Ambulance
Co. No. 4..... 1913
Rasmussen, Nels, Ambulance

Co. No. 4..... 1912
Robinson, Daniel W., Sergt. 1st
Cl. H. C., U. S. A..... 1912
Siedler, August, Sergt. 1st Cl.
H. C., U. S. A..... 1914

Iloilo, Panay.

Benche, Carl S..... 1913

Jolo.

Beal, Walter Andrew..... 1913
Dietz, Henry Warren..... 1913
Grose, James William..... 1913
Pollard, Louis J..... 1913
Smelsey, Samuel, Sergt. 1st Cl.
H. C., U. S. A., Augur Bar-
racks 1913

Legaspi.

Leonard, John Francis, Sergt.
1st Cl. H. C., U. S. A..... 1913

Manila.

Barclay, James Martin..... 1913
Behre, John Rufus, Sgt. 1st C.
H. C., U. S. A..... 1912
Begley, Henry L., Sgt. 1st Cl.
H. C., U. S. A..... 1913
Brown, Arthur E., Sgt. 1st Cl.
H. C., U. S. A..... 1911
Byers, Jason David, Sgt. 1st Cl.
H. C., U. S. A..... 1912
Clark, Amos Wilson, Sgt. 1st Cl.
H. C., U. S. A..... 1913
Comfort, Newton C., Sgt. 1st Cl.
H. C., U. S. A..... 1904
Cushman, Gabriel..... 1912
Frankau, Gustave, Sergt. 1st Cl.
H. C., U. S. A..... 1912
Gallagher, Charles, Sgt. 1st
Cl. H. C., U. S. A..... 1912
Gavagan, Edward Daniel, Sergt.
1st Cl. H. C., U. S. A..... 1912
Guerrero, Leon Maria..... 1904
Hitch, Edgar Thomas... 1912
Kroger, Harry Albert Richard,
P. H..... 1913

PHILIPPINE ISLANDS—RHODE ISLAND—SOUTH CAROLINA—SOUTH DAKOTA.

Merryman, James R., Sergt. 1st

Cl. H. C., U. S. A..... 1913

Murphy, William Joseph..... 1913

Newman, Emanuel, Sergt. 1st

Cl. H. C., U. S. A..... 1913

Phares, Walter L..... 1912

Phillips, Ira Brooks, Sergt. 1st

Cl. H. C., U. S. A..... 1912

Schultheis, Raymond..... 1914

Senecal, Henry C..... 1911

Spry, Ezekiel..... 1914

Young, Charles C., Sergt. 1st

Cl. H. C., U. S. A..... 1912

Zamora, Manuel, Sergt. 1st Cl.

H. C., U. S. A..... 1908

Minandao.

Eble, Charles F..... 1911

Frese, Otto Frederick..... 1912

Kennedy, Robert Griffey..... 1914

Waitz, August Henry..... 1914

Pettit Barracks, Zamboanga.

Cook, Harry, M. H..... 1913

Neville, Arthur, Sergt. 1st Cl.

H. C., U. S. A..... 1911

Samar, Camp Connell.

Riesenberg, Max..... 1913

Torrey Barracks.

Holt, Frank, Sergt. 1st Cl. H.

C., U. S. A..... 1911

RHODE ISLAND.

Fort Adams.

Fender, Walter E..... 1914

Fort Greble.

Brower, Thomas E..... 1912

Mathews, Elmo Denton, Sergt.

1st Cl. H. C., U. S. A..... 1912

Narragansett Pier.

Davis, Peter Bernard..... 1909

Newport.

Downing, Benjamin Franklin... 1886

Wright, James Tytler..... 1910

Pawtucket.

Brennan, James Edward..... 1909

Morgan, George Smith..... 1909

Providence.

Anthony, Edwin Perkins..... 1909

Blanding, William Oliver..... 1894

Blumenkranz, Emil Simon..... 1911

Claflin, Albert Whitman..... 1913

Colton, Edward Thomas..... 1909

Corrigan, Michael Henry..... 1913

Fairbanks, Geo. Edwin Barrows 1909

Gilbert, Charles A..... 1913

Haynes, Herbert..... 1908

O'Hare, James, Phar.D..... 1888

Parker, Gilbert Ritchie..... 1910

Pearce, Howard Anthony..... 1894

Reiner, Nicholas F..... 1913

Strickland, Franklin Nelson.... 1905

SOUTH CAROLINA.

Anderson.

Evans, George William..... 1912

Charleston.

Hyde, Joseph Bell, Jr., Ph.G.. 1909

Plenge, Henry..... 1910

SOUTH DAKOTA.

Beresford.

Kriebs, Frank Delbert, Ph.G... 1910

Bonesteel.

Kenaston, Hampton Ray (Mrs.) 1914

Boxedie.

Maas, Henry Conrad..... 1910

Brookings.

Whitehead, Bower Thomas.... 1908

Centerville.

Heisler, John Emery..... 1910

Conde.

Ross, Otto Ellsworth, Ph.C.... 1908

Crocker.

Koelle, Otto Charles..... 1902

Dell Rapids.

Bent, Edward Clarence..... 1905

Estelline.

Hoffelt, Edward..... 1910

SOUTH DAKOTA—TENNESSEE.

<i>Garden City.</i>	
Wagner, Josiah Feller.....	1912
<i>Hot Springs.</i>	
Highley, L. E.....	1913
<i>Huron.</i>	
Holstrom, William A.....	1913
<i>Langford.</i>	
Cook, Harry Clarence.....	1912
<i>Lead.</i>	
Brown, Floyd Woodford.....	1910
<i>Mitchell.</i>	
Scallin, Stephen Harmon.....	1910
<i>Mobridge.</i>	
Olson, Ferdinand P.....	1910
<i>Redfield.</i>	
Swartz, George Fisher.....	1909
<i>Sioux Falls.</i>	
Bernhart, Peter Kristoffer.....	1910
Dunning, Lyman Taylor.....	1906
<i>Sturgis.</i>	
Williams, Arthur Reynolds....	1910
<i>Vermillion.</i>	
Cook, Alfred N.....	1913
<i>Watertown.</i>	
Jones, David Franklin.....	1895
Zieske, Arthur.....	1910

TENNESSEE.

<i>Bolivar.</i>	
Cook, Charles Samuel.....	1912
<i>Chattanooga.</i>	
Voight, Joseph Frederick.....	1893
<i>Clarksville.</i>	
Justice, Jack Edwin.....	1914
<i>Columbia.</i>	
Smith, Richard.....	1910
<i>Delherd.</i>	
Bass, Francis Marion.....	1913

<i>Dover.</i>	
Fuson, Harry L.....	1914
Noaks, Richard Sidney.....	1911
<i>Etowah.</i>	
Howard, James D.....	1914
<i>Dyersburg.</i>	
Jacocks, John T.....	1913
Lipscomb, W. L.....	1914
<i>Jackson.</i>	
Nance, Oscar Jones.....	1914
<i>Johnson City.</i>	
Brown, Frank Sevier.....	1914
Gregory, Philip Levert.....	1914
<i>Knoxville.</i>	
McBath, William A.....	1913
Rosenthal, David Abraham.....	1894
<i>Lawrenceburg.</i>	
Finley, James A.....	1914
<i>Lebanon.</i>	
Wooten, Yandell Paul.....	1914
<i>Lynnville.</i>	
Waldrop, R. W.....	1914
<i>Memphis.</i>	
Crowe, Robert Latta.....	1914
Macbeth, T. M.....	1913
Mayo, Frederick William.....	1909
ROBINSON, JAMES SCOTT.....	1869
Robinson, Thomas Aubrey.....	1914
Ward, Francis Watson.....	1908
<i>Nashville.</i>	
Bader, Charles Henry.....	1914
Blodau, Gus A.....	1914
Bloomstein, Max.....	1910
Bradshaw, Sam Sandapher.....	1914
Brown, Louis Polk.....	1913
Brumit, Juel Guilford.....	1914
BURGE, JAMES OSCAR.....	1878
Clark, Ira Benton.....	1909
Cook, Moses.....	1910
Davis, Samuel Charles.....	1913
Eves, Robert Lee.....	1909
Goodloe, James K.....	1914
Hubbard, George Whipple.....	1913

TENNESSEE—TEXAS.

Hutton, Major Ernest..... 1910
 Jackson, Lester N..... 1914
 Kemper, Earl..... 1911
 King, G. Hanserd..... 1914
 Kleiser, Robert J..... 1914
 Mansfield, James Roy..... 1914
 Martin, Andrew Joseph..... 1910
 McDaniel, John Rogers..... 1911
 McGill, John Thomas..... 1900
 Nickel, August..... 1914
 Pully, Luther Smith..... 1910
 Rogoff, Julius M..... 1914
 Ruddiman, Edsel Alexander.... 1894
 Sand, Jerome Bonaparte..... 1910
 Schott, Ernest J..... 1914
 Smith, Frank Leslie..... 1910
 Thompson, Robert Lee..... 1914
 Wadder, Arlie L..... 1914
 Waldrum, Jonas Y..... 1914
 Webb, Anderson Miller..... 1914
 Webb, Evans Hall..... 1914
 Weise, Carl E..... 1914
 White, William Rufus..... 1904
 Whitworth, Charles Bell..... 1914
 Young, Clarence C..... 1910

Newbern.

Westbrook, Charles Gray..... 1912

Sewanee.

Conger, S. Iliff..... 1913

Sharon.

Shannon, Thomas J..... 1905

Shelbyville.

Shapard, Henry Clay..... 1914

Somerville.

Rhea, Howard M..... 1914

Waverly.

Finch, Ernest C..... 1913

White House.

Covington, Robert Earl..... 1914

Whiteville.

Gates, William Irby..... 1913

Winchester.

Prince, Clofton O..... 1914

TEXAS.

Annona.

Shipe, Columbus A. (Miss).... 1914

Austin.

Jackson, Hugh Cyrus..... 1909

Bomarton.

Seydler, Robert..... 1910

Brownsville.

Willman, William George..... 1904

Cooper.

Brown, Robert Owen..... 1914

Corsicana.

Coulson, James Thomas..... 1906

Crockett.

Bishop, William Penn..... 1914

Dallas.

Althoff, Samuel Young..... 1914

Anderson, Oscar Ludwig..... 1911

De Lorenzi, Albert..... 1890

Duncan, Chester Arthur..... 1906

Eberle, Eugene Gustavus, Ph.G.,

A.M. 1896

Hawkins, Tom W..... 1912

Jelton, Louis McKnight..... 1910

Medlock, Charles Thomas..... 1911

Mitchel, Lloyd Benjamin..... 1912

Schrodt, Jacob, Ph.G..... 1903

El Paso.

Ryan, Ambrose Eugene..... 1907

Encinal.

Guerrero, Juan Cantu..... 1911

Forney.

Adams, Walter Dickson..... 1913

Fort Worth.

Brashear, James Preston..... 1909

Covey, John Walker..... 1908

Needham, Robert Hamilton.... 1906

Robbins, Kenneth Cambus..... 1913

TEXAS—UTAH.

Galveston.

Buckner, John Clark.....	1905
Cline, Raoul Rene Daniel, B.A., B.S., A.M., Ph.G., M.D.....	1898
Koester, Hermann.....	1910
Orton, Ingomar Francois.....	1891

Gonzales.

Mohrmann, John Max.....	1912
Walker, Robert Hamilton, B.S., Ph.M.	1907

Hallettsville.

Saccar, Michael, Ph.G.....	1905
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Houston.

Burgheim, Jacob.....	1892
Gilmer, Bryant Brewster.....	1913
Jones, Randal John Western...	1913
Kiesling, Adolph Ernest.....	1910

Laredo.

Daily, Joseph.....	1911
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Lockhart.

Westmoreland, Edwin Reese...	1910
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Lott.

Belson, Maynard E.....	1914
------------------------	------

Lubbock.

Duering, Henry Charles.....	1901
-----------------------------	------

McKinney.

Dulaney, Joseph Field.....	1902
----------------------------	------

New Braunfels.

Schumann, Henry Valentine....	1911
-------------------------------	------

New Castle.

Watson, Elisha Thomas.....	1912
----------------------------	------

Overton.

Barksdale, Rogers Americus....	1914
--------------------------------	------

Quanah.

Pruden, Floyd E.....	1914
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San Antonio.

Dreiss, Hermann E. F.....	1912
Nester, Herman August.....	1909
Posey, Henry Gibbons.....	1914
Schaefer, Laura.....	1909
Smith, William L.....	1912

San Saba.

Gosch, Clarence G.....	1910
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Taylor.

Carleton, Henry Lincoln.....	1910
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Texas City.

Hardenbrook, Burton.....	1912
Maynard, Heatherly.....	1914
Riess, Herman William, Sgt. 1st Cl. H. C., U. S. A.....	1903
Schmitman, Henry.....	1914

Waco.

Mason, John G.....	1911
Morrison, Wade Brocken- borough	1911

Waelder.

Brookes, Virginia Cade (Miss)	1901
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Westhoff.

Bomba, Onufry Joseph.....	1910
---------------------------	------

Winfield.

Beck, Joseph Wilson.....	1914
--------------------------	------

Yoakum.

Koerth, Emil Christian.....	1910
-----------------------------	------

UTAH.

Brigham.

Eddy, Wynn Leland.....	1908
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Cedar City.

Bladen, John Mount.....	1908
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Logan.

Riter, Benjamin Franklin.....	1910
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Ogden.

Culley, John, Ph.G.....	1908
Misch, Edward Frederick.....	1910

Salt Lake City.

Dayton, Walter Henry, Ph.G...	1908
Harms, Herman E.....	1908
Van Dyke, Charles.....	1908
Whitworth, Frank Edgar.....	1908

VERMONT—VIRGINIA.

VERMONT.

Barton.

Pierce, Fred Dutton..... 1909

Bennington.

Gokay, William Lewis..... 1914

Brattleboro.

Root, Wilfred F..... 1912

Burlington.

Beebe, Mason Gaylord..... 1913

Zottman, William Henry..... 1903

Marshfield.

Gilman, Elbridge Wheeler..... 1907

Montpelier.

Slade, Henry Allen..... 1899

Morrisville.

Cheney, Arthur Lewis..... 1907

N. Ferrisburg.

Claflin, Walter Addison..... 1896

Orleans.

Austin, Arthur Orlo, Pharm.D. 1909

Rutland.

Farmer, F. E. D..... 1914

McClallen, E. Gregory..... 1912

Trudel, Lucien Joseph..... 1910

St. Johnsbury.

BINGHAM, CHARLES CALVIN.... 1875

Eastman, Welcome B..... 1912

Vergennes.

Neville, Timothy..... 1912

Windsor.

Skinner, Charles Herbert..... 1914

VIRGINIA.

Charlotte C. H.

Williams, Walter G..... 1913

Culpeper.

Goldsborough, Charles Henry... 1898

Falls Church.

Mankin, George Tyree..... 1909

Fort Hunt.

Person, Thomas..... 1911

Fort Meyer.

Ellingsen, Emil, Sgt. 1st Cl. H

C., U. S. A..... 1911

Weir, Samuel A..... 1911

Harrisonburg.

Avis, James Little..... 1905

Lynchburg.

Fleet, Charles B..... 1909

Hamner, Edward Chambers.... 1909

Penick, Douglas McGill..... 1913

Martinsville.

Kearfott, Clarence Piercall.... 1908

Norfolk.

Arrington, Harry Seldan..... 1914

Nelligar, Frederic Dennis..... 1907

Taylor, Thomas Ramsay..... 1913

Petersburg.

Knock, Thomas Franklin..... 1911

Phoebus.

Congdon, George Gardner..... 1903

Richmond.

Bolenbaugh, Albert..... 1909

Booker, Robert Lewis..... 1910

Brandis, Ernest Linwood..... 1906

Briggs, Andrew Gessner..... 1890

Curd, Thomas Nelson..... 1907

Echols, George Jacob..... 1914

Johann, Adam Ernest..... 1910

Miller, Turner Ashby, Ph. G... 1894

Taylor, Edgar Darby..... 1910

Roanoke.

Barnes, Henry Cooper..... 1905

Fox, Charles Dunsmore..... 1913

Suffolk.

Hall, Joseph Patten..... 1900

Tazewell.

Jackson, John E..... 1913

WASHINGTON—WEST VIRGINIA.

WASHINGTON.

Colfax.

Leavitt, Clarence Ashton..... 1913

*Council.*Garrison, Dayton Burt, Jr.,
Ph.G. 1913*Everett.*

Conner, Ray Bradford..... 1912

Fort Casey.

Greeno, Edgar O..... 1913

Fort Flagler.

Schulz, Emiel..... 1913

*La Conner, Skagit Co.*Joergensen, Gerhard Johan Carl
Sophus 1889*Lyman.*

Roach, Edna Winnifred..... 1914

Pullman.

Maxwell, Asa Frank..... 1912

Watt, George Henry..... 1896

Puyallup.

Truedson, Eric P..... 1904

Vitous, Lumir G..... 1914

Vitous, Walter J..... 1914

Seattle.

Blalock, Jesse Nelson..... 1909

Brown, Burton Augustus..... 1910

Goodrich, Forest Jackson..... 1913

Herman, Harry Emile..... 1912

Hicks, Claude Everett..... 1913

Holmes, Henry Elliott..... 1880

Johnson, Charles Willis, Ph.C.,
B.S., Ph.D..... 1903

Kinsel, Edward Charles..... 1912

Lee, James..... 1913

Linton, Arthur Wilson..... 1910

Lyda, William Kerr, Sergt. H.
C., U. S. A..... 1912

McLean, James Walter..... 1911

McTague, Edward Joseph..... 1913

Osseward, Cornelius, Ph.C..... 1897

Rubenstein, Louis..... 1909

Siegel, Harry Jacob..... 1912

Walker, Robert Monroe..... 1913

Watson, Joseph Ryerson, Ph.C. 1904

Snohomish.

Gilbertson, Louis Steven..... 1912

Wilbur, Lot..... 1896

Spokane.

Clizer, William Arthur..... 1913

Ferte, Emil P..... 1913

Murphy, Barry Franklyn..... 1913

Tacoma.

Kent, Nick Gardner..... 1909

Sivear, Fred George, Ph.C..... 1912

Tenino.

Battista, Angelus Andrew..... 1913

Vancouver Barracks.

Rose, Martin..... 1911

Wilbur.

Bandy, George, Ph.G..... 1905

WEST VIRGINIA.

Bluefield.

Goodykoontz, Charles Henry... 1909

Buckhannon.

Young, George Orville, Ph.G.. 1907

Clarksburg.

Haymaker, Frank Berkshire... 1906

Glenville.

Tierney, James Aloysius..... 1910

Harper's Ferry.

Dittmeyer, Walter E., P.D.... 1907

Hinton.

Rose, Shannon Samuel..... 1909

Huntington.

Price, Walter C..... 1910

Pine Grove.

Morgan, Thomas Lee..... 1907

Sutton.

Walker, Alfred..... 1905

Terra Alta.

Scott, S. M., Jr..... 1914

WEST VIRGINIA—WISCONSIN—WYOMING—DOMINION OF CANADA, MANITOBA—
NOVA SCOTIA.

Welch.

Downs, Bertis E..... 1913

Wheeling.

Coleman, John..... 1905

Irwin, William Wilson..... 1914

WISCONSIN.

Eau Claire.

Boberg, Otto Johan Sinius.... 1903

Fond du Lac.

Kremer, Berthold James..... 1913

Nooner, Thompson A..... 1914

Jefferson.

Fischer, Ray Otto..... 1911

La Crosse.

Beyschlag, Charles..... 1880

Hebbard, Edward Smith..... 1907

Madison.

Fischer, Richard, Ph.D..... 1901

Keim, Charles Adam..... 1913

KREMERS, EDWARD, PH.G., PH.D. 1887

Langenhan, Henry August..... 1908

Lewis, Henry..... 1908

MILLER, EMERSON ROMEO..... 1895

Williams, Edward..... 1906

Milwaukee.

Alberts, M. Lee..... 1912

Dadd, Robert Morrow..... 1896

Eckstein, Solomon A..... 1912

Graw, Paul..... 1912

Haertlein, George Henry..... 1910

Kemp, Fred W..... 1912

Kettler, Edward, Jr..... 1896

Krembs, Ernest Maximilian.... 1903

Lange, Leonard A..... 1913

Piszcsek, Theodore A..... 1913

Raeuber, Edward Gottfried,

Ph.G. 1900

Ruenzel, Henry Gottfried..... 1892

SCHRANK, CHARLES HENRY..... 1876

Sommer, Richard Ernst Wil-

helm 1909

Spiegel, Adolph..... 1905

Urban, Leopold Charles..... 1912

Niellsville.

Sniteman, Charles Clarence.... 1881

Oconomowoc.

Peters, Henry August..... 1903

Racine.

Horlick, Alexander James..... 1904

Horlick, William..... 1913

Horlick, Wiliam, Jr..... 1913

Reedsburg.

Mueller, Frank F..... 1911

Watertown.

Eberle, Arthur Ralph, Ph.G.... 1907

Eberle, Herman Theodore..... 1901

Wausau.

Albers, William W..... 1909

WYOMING.

Fort D. A. Russell (Cheyenne).

George, William Rushby, Sergt.

1st Cl. H. C., U. S. A..... 1912

Jennings, Harry Milton..... 1912

Kishon, Adolph M., Sergt. H.

C., U. S. A..... 1914

Stevenson, Ephraim Pennington 1911

Tyson, L. Raymond, M. P. H.. 1912

DOMINION OF CANADA.

MANITOBA.

Winnipeg.

Bletcher, Henry Ernest John... 1904

Campbell, Charles William.... 1910

Colcleugh, Murray Chisholm... 1913

Harrison, George Waller..... 1914

Nesbitt, Evelyn..... 1910

NOVA SCOTIA.

Halifax.

Simson, Francis Cook..... 1876

ONTARIO—QUEBEC—FOREIGN COUNTRIES.

ONTARIO.

Guelph.

Stewart, Alexander..... 1905

Ottawa.

Watters, Henry..... 1912

Picton.

Case, Edmund Wendell..... 1912

Stratford.

WAUGH, GEORGE JAMES..... 1862

Toronto.

Heebner, Charles Frederick.... 1894

QUEBEC.

*Three Rivers.*Williams, John Lewis, Doctor
Optics 1909*Westmount.*Moore, Alexander Benjamin
Journeaux 1914MEMBERS RESIDING IN FOREIGN COUNTRIES (*except Canada*).

Abreu, Gerardo Fernandez, Havana, Cuba..... 1907
 Adan, Francisco Varcla, Camaguey, Cuba..... 1911
 Aggan, Elias George, Tanta, Egypt..... 1913
 Alacan, José Praxedes, Philadelphia, Pa..... 1907
 Baum, Fred Christ, San Juan, Porto Rico..... 1911
 Bernstroem, Nils Gustaf, Gotenborg, Sweden..... 1906
 Biosca, Placido, M.D., D.Sc., Pharm.D., Havana, Cuba..... 1907
 Bosque, Arturo, Havana, Cuba..... 1907
 Capote, José, Havana, Cuba..... 1907
 Carballo, Cristobal Trillo, Isle of Pines, Cuba..... 1911
 Carballo, Emilio Trillo, Isle of Pines, Cuba..... 1911
 Carbonell, Francisco J., Yaguajay, Cuba..... 1913
 Cartaya, Julio Hernandez, Havana, Cuba..... 1907
 Curquejo, Antonio Gonzales, Havana, Cuba..... 1907
 Delgado, Joseph Vincent, Ph.C., Private, 1st Cl., U. S.A., Colon, Panama 1913
 Diaz, José Guillermo, Havana, Cuba..... 1907
 Diaz, Joseph Macias, Havana, Cuba..... 1913
 Donestevez, Juan, Palmira, Cuba..... 1911
 Fong, Job, Canton, S. China..... 1913
 Gallardo, Basilo Gomez, Holgium, Oriente, Cuba..... 1911
 Gallardo, Bonifacio Gomez, Havana, Cuba..... 1911
 Garcia, José Ramon R., Havana, Cuba..... 1912
 Gatell, Manuel R., Cienfuegos, Cuba..... 1911
 Grimany, Frederico, Santiago de Cuba..... 1912
 Hallaway, Robert Railton, B.Sc., Ph.D., Carlisle, England..... 1905
 Herrera, Francisco, Havana, Cuba..... 1907
 Howson, William Scott, Sgt. 1st Cl., H. C., U. S. A., Camp E. S. Otis,
 Panama 1914

FOREIGN COUNTRIES.

Jacobs, Charles Christian, Sancti Spiritus, Cuba.....	1901
Johnson, Manuel, Havana, Cuba.....	1907
Johnson, Theodore, Havana, Cuba.....	1911
Jurado, Bolivar, Ph.C., Ph.B., Panama City, Panama.....	1912
Ladakis, Triantaphylle, Beirut, Syria.....	1907
Lemos, Constantine Diamanti, Rue Trassa, Asia Minor.....	
Llerena, Maria Gonzales y, Havana, Cuba.....	1913
Martin, Nicholas Henry, Gateshead-on-Tyne, England.....	1891
Mendez, Rafael Martin, Larer, Porto Rico.....	1914
Morales, Celestino Garcia, Havana, Cuba.....	1907
Murray, Alexander, San José de Costa Rica.....	1903
Patch, James Alfred, Beirut, Syria.....	1903
Pirie, Alfred Mitchell, Cartago, Costa Rica.....	1903
Porro, Alvaro, Camaguey, Cuba.....	1911
POWER, FREDERICK BELDING, London, England.....	1872
Ramirez, Rogelio H., Marianao, Cuba.....	1912
Rebustillo, Manuel G., Manzanillo, Cuba.....	1912
Remirez, Prof. Francisco, Havana, Cuba.....	1912
Sarra, Ernesto, Havana, Cuba.....	1907
Taquechel, Francisco, Havana, Cuba.....	1908
WELLCOME HENRY SOLOMON, London, England.....	1875
Wunez, Jorye L., Havana, Cuba.....	1913

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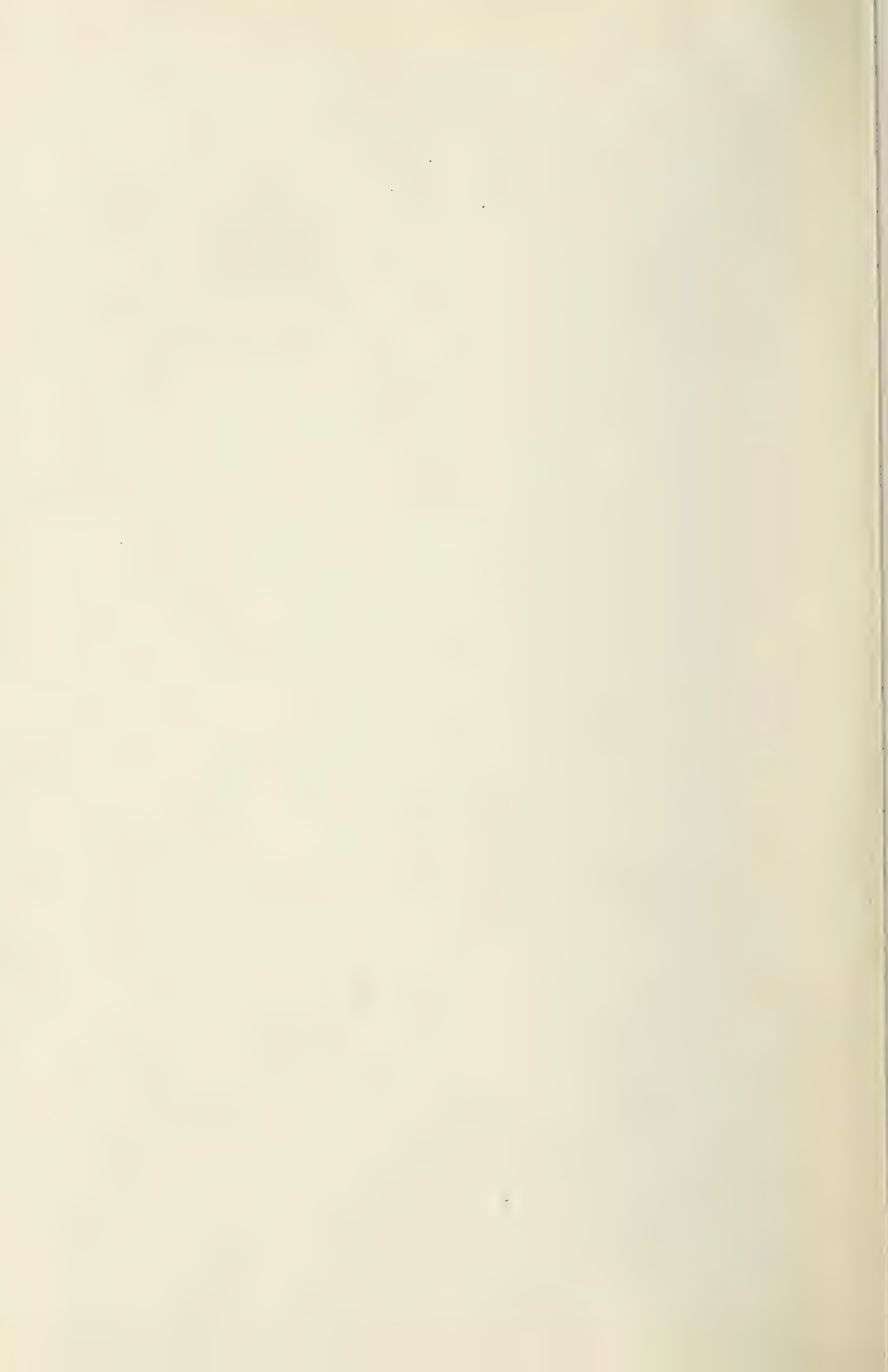
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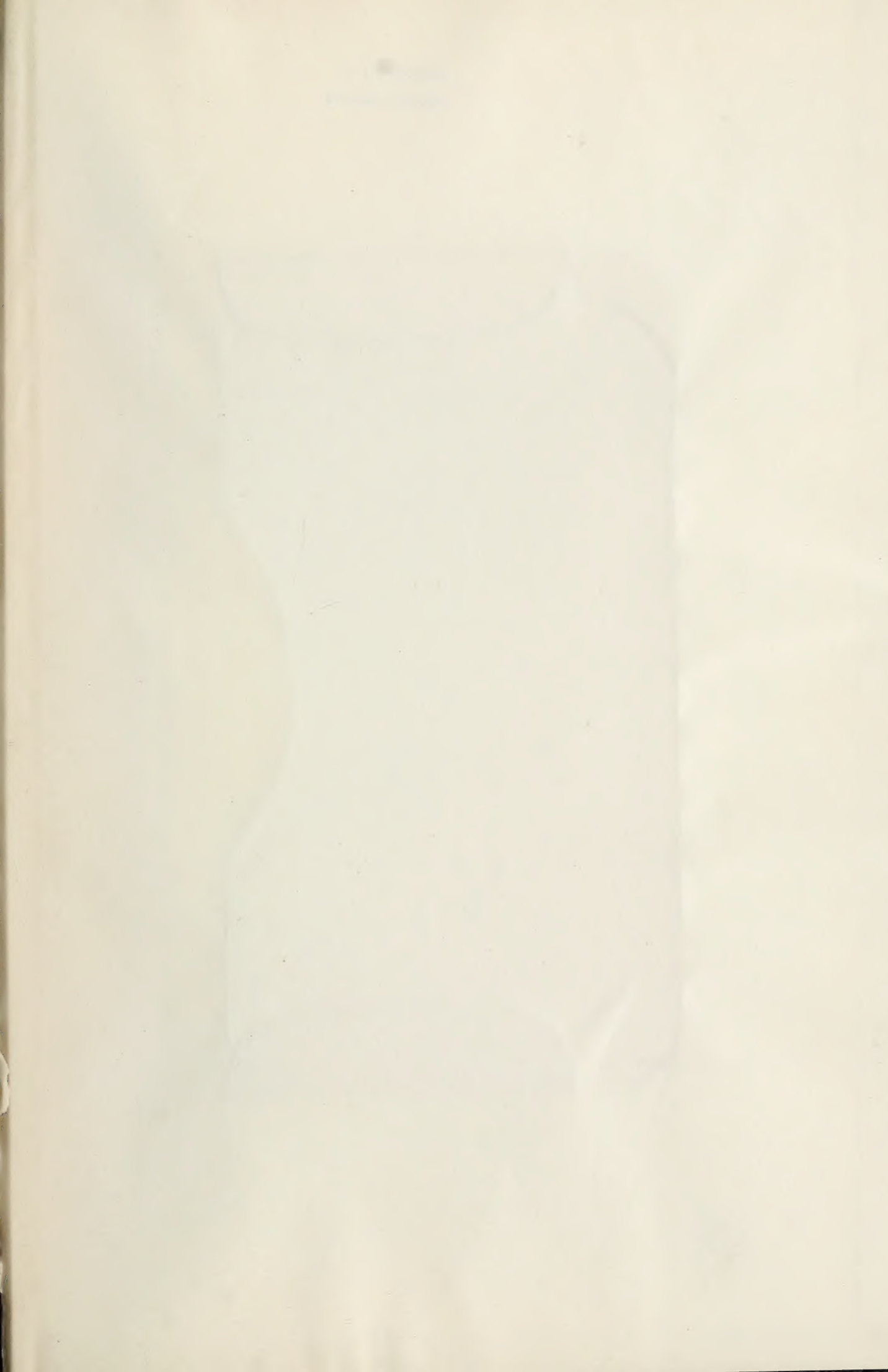
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